Vol. I APRIL, 1915 No. 4

224

The INTERNATIONAL JOURNAL OF ORTHODONTIA

A Monthly Journal Devoted to the Advancement of the Science of Orthodontia

PUBLISHED BY
THE C. V. MOSBY COMPANY
SAINT LOUIS

$3.00 Per Annum Single Copies, 30 Cents

Listerine In Orthodontia

In the practice of orthodontia there is no antiseptic so welcome to the patient—none more efficient or lasting in results—as

LISTERINE

Successful orthodontists regard Listerine as an indispensable antiseptic because of its reliability, high efficiency, uniform strength and agreeable taste.

Listerine is a saturated solution of boric acid, supplemented with the oils of eucalyptus, thyme, mentha, gaultheria and baptisia.

Successful dentists are daily demonstrating the fallacy of using alkaline mouth washes, whose reaction tends to impair the natural secretions of the oral cavity.

The slight acidity of Listerine stimulates the flow of saliva and increases its preservative power.

LAMBERT PHARMACAL CO. SAINT LOUIS

AUTOTOXEMIA

Is unquestionably one of the most constant causes of dental caries and the early loss of the teeth. Intestinal elimination is, therefore, a fundamental detail of any effective treatment—or prophylaxis—and in selecting measures for this purpose, the dentist will find

PRUNOIDS

(EDIBLE TABLETS)

the solution of a most important problem. Happily the administration of this ideal product is not merely attended by catharsis. Its effects are much more far reaching, and used systematically PRUNOIDS will restore the functional activity of the whole intestinal canal. The glandular structures are stimulated, the muscles are toned and adequate elimination assured.

The remarkable freedom of PRUNOIDS from griping or reactionary constipation, and its physiological stimulation of intestinal processes, make it the most satisfactory laxative that the dentist can employ.

Liberal samples on request.

THE SULTAN DRUG CO.
ST. LOUIS, MO.

Sold by Druggists.

INTERNATIONAL PORTRAIT SERIES

No. 2

(After Locy)

RICHARD OWEN

(1804-1892)

Principal Works:

Odontography (2 vols.), 1840-1845.

Comparative Anatomy of Vertebrates, 1866-68.

The International Journal of Orthodontia

Editor: Martin Dewey, D.D.S., M.D.

VOL. I ST. LOUIS, APRIL, 1915 NO. 4

ORIGINAL ARTICLES

THE IMPORTANCE OF CORRECTING MALOCCLUSION DURING THE PERIOD OF TOOTH ERUPTION.

A Plea to the General Practitioner.

BY M. N. FEDERSPIEL, B.SC., D.D.S., M.D.
Professor of Stomatology, Medical Dept., Marquette University, Milwaukee, Wis.

THE correction of malocclusion during the period of tooth eruption is not recognized as it should be by the average dental practitioner. This is largely due to the fact that orthodontic training in the past was along mechanical lines; little or no attention was paid to the forces of occlusion, the relation of the inclined planes, etc. Diagnosing and prognosing were practically ignored, the treatment was a matter of *getting the teeth to look more even* irrespective of their functional and anatomical relations.

Parents who notice their little ones manifesting irregularities of the teeth during the erupting period, call upon their dentist for treatment. The dentist invariably tells the parents to wait, that the child is too young, that nature will do much to help matters, and that after all of the teeth have erupted he will do something. Such advice and soothing dental talk is of the most damaging kind, and unless given prompt attention, the child will suffer the stigma of a crippled arch, malposition of the teeth and sometimes a pronounced facial deformity.

The writer hopes to impress upon the reader that in order to give advice and to outline the treatment in malocclusion for his patient, he must first disregard mechanical appliances. To begin with he must have in mind a normal relation of the inclined planes (Fig. 1).

Any deviation from the normal, be it ever so slight, must be considered a form of malocclusion. Then, what is malocclusion? Malocclusion is the abnormal relation of the inclined planes when the jaws are closed.

Malocclusion usually begins during the period of tooth eruption; very often it is progressive, remaining so until all of the permanent teeth have erupted. The period of eruption in permanent teeth must be considered as a critical one in a child's life. It must be regarded as a time when the

relation of the teeth, the dental arches and the adjacent parts will occupy a normal position or an abnormal position of a lesser or greater degree. It is the duty of the family dentist to give the matter deep consideration, to advise the parents whether or not the masticatory organs are developing correctly anatomically.

It is indeed sad to see hundreds of children growing into manhood and womanhood deprived of orthodontic treatment so necessary to the establishing of normal dentition and a pleasing appearance. One has but to study the mouths of our young Americans and see the frightful arrested developments of the dental arches and jaws in the majority of the children. Such conditions are but the first steps to a progressive malocclusion, which will, as time goes on, become greater and manifest a tendency to ill-health. Mal-

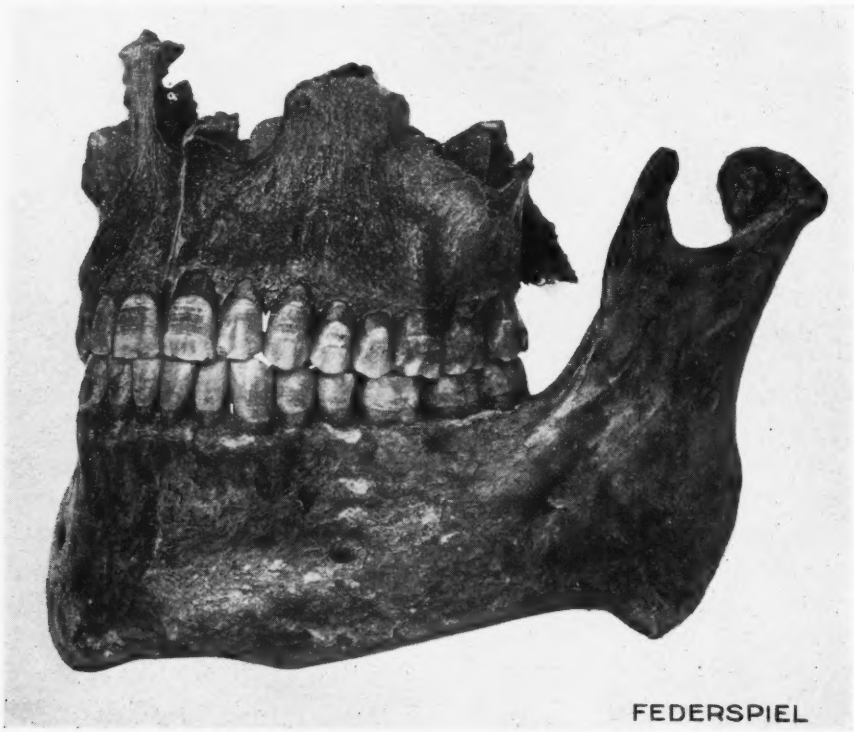


Fig. 1.—Showing a normal relation of the teeth.

occlusion and dento-facial deformity once established and fixed remain so during life. The countless thousands in all walks of life are but living examples of a crippled dental apparatus. It tells the story of what might have been under the care of competent men, at a time when orthodontic treatment would have been favorable to a permanent cure. While it is true that much can be gained in improving the condition of the mouths of adults suffering from malocclusion, the prognosis usually is unfavorable. Therefore, it is the duty of orthodontists to advise and educate the public to the idea that, in order to establish a permanent cure in malocclusion, the treatment must be administered during the period of tooth eruption.

Figs. 2, 3, and 4 show the upper and lower jaws exposed so that the position of the teeth can be seen during eruption. The reader can appreciate

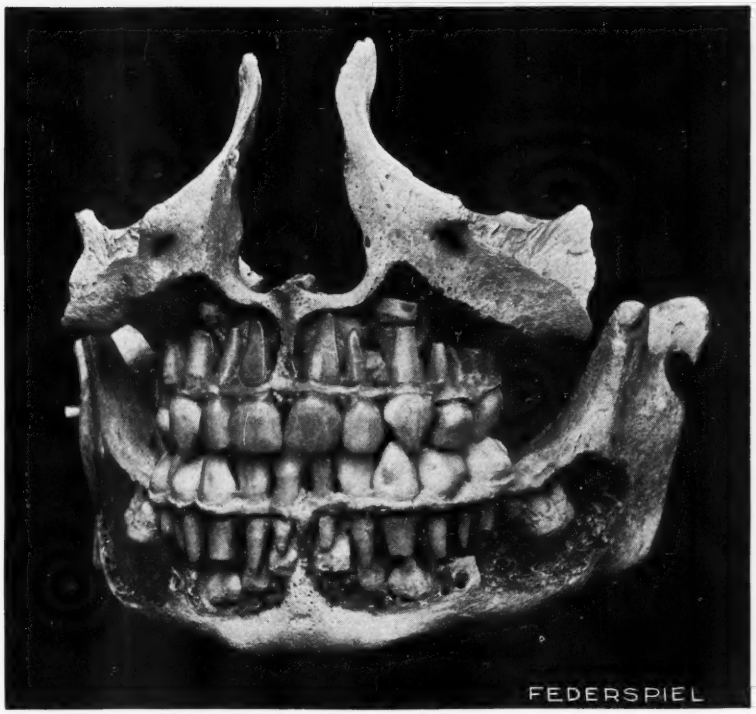


Fig. 2.—Showing upper and lower jaws with outer plate dissected away to show the developing permanent teeth and the deciduous teeth in normal relation at about the fourth year of life.

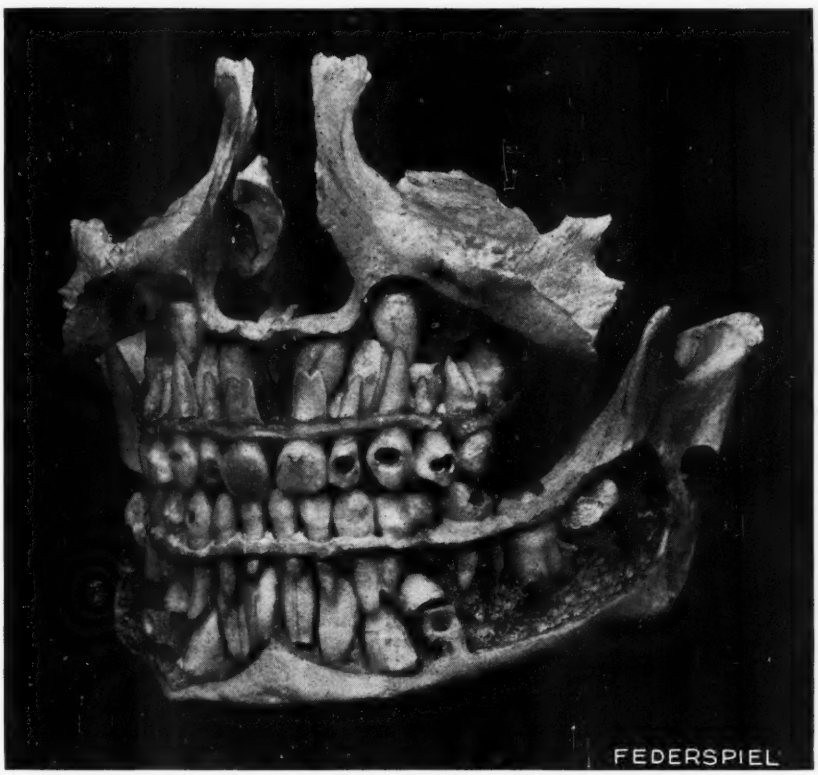


Fig. 3.—Showing upper and lower jaws with outer plate removed to expose the developing permanent teeth. Note the tendency of the deciduous teeth to spread apart to make room for the permanent teeth at about the sixth year of life.

the necessity of jaw growth to permit room for the teeth to occupy their normal position. Interference with the normal growth will naturally deflect the erupting tooth from its normal path and may start the first step of progressive malocclusion. Therefore, it is necessary to begin orthodontic treatment promptly and guide the malposed tooth into its normal path and prevent other teeth from assuming positions of malocclusion. Such a procedure assures the patient of a normal denture and a pleasing appearance.

I have often been asked when I would undertake a case for the correction of malocclusion. My answer is: the younger the patient, the better and easier the correction; in other words, just as soon as the child manifests a tendency for the teeth to erupt in an abnormal position. This can be illustrated in the following case:

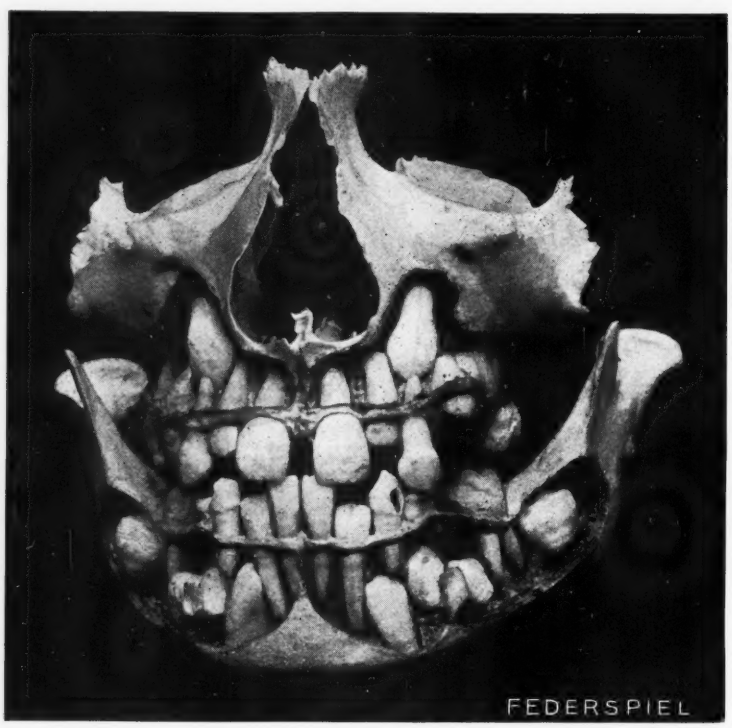


Fig. 4.—Showing upper and lower jaws with outer plate removed to expose the developing permanent teeth. Note the eruption of some permanent teeth and the need of plenty of room in the arch for those teeth to erupt normally at about the eighth year of life.

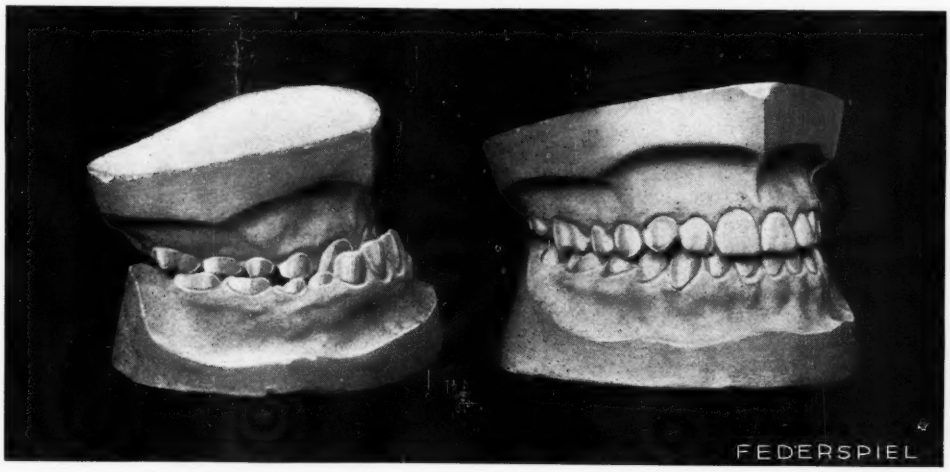
Case 1.—Gladys P., age ten years, referred to me by her family dentist for orthodontic treatment. All of the child's teeth had not erupted at this time, yet there was the beginning of a pronounced malocclusion. The upper permanent incisors were in linguoversion, complicated by the early loss of the upper right deciduous cuspid. In order to prevent further progress of the deformity, the child was promptly placed under orthodontic treatment. It took eighteen months to develop the upper jaw and restore the teeth to their normal occlusion. (See Fig. 5.) I doubt if any such results could have been obtained had the child been older when the treatment was begun.

I wish to call your attention to the two following cases:

Case 2.—Donald C., age nine years, referred to me by his family dentist

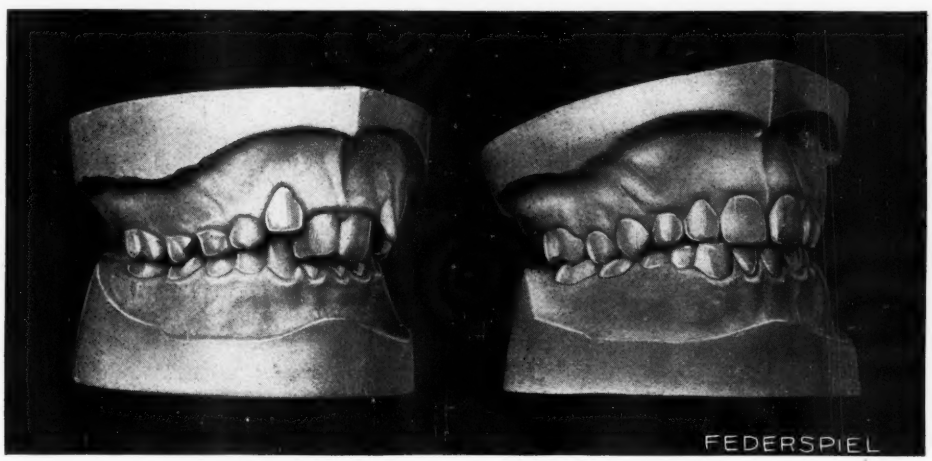
for orthodontic treatment. Diagnosis—Distoclusion, complicated by malposition of the upper incisors. This boy was given immediate orthodontic care and after one year I succeeded in getting the arches in a normal relation, and then the teeth erupted in a normal position. (See Fig. 6.)

Case 3.—Margurette M., age ten years, referred to me by her family dentist. Diagnosis—Distoclusion, complicated by a malposition of the



A. B.

Fig. 5.—Showing result of early orthodontic treatment. *A*. Before treatment. *B*. After treatment. Age ten years.



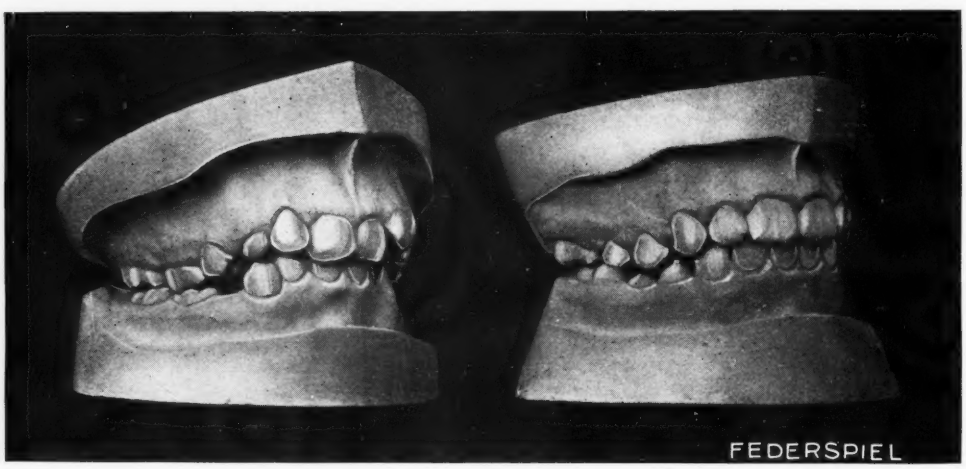
A. B.

Fig. 6.—*A*. Showing a tendency for malocclusion to progress. *B*. Result after treatment. Age nine years.

upper and lower incisors. The patient was put under orthodontic care and in ten months I succeeded in establishing a perfect relation of the arches and teeth. (See Fig. 7.)

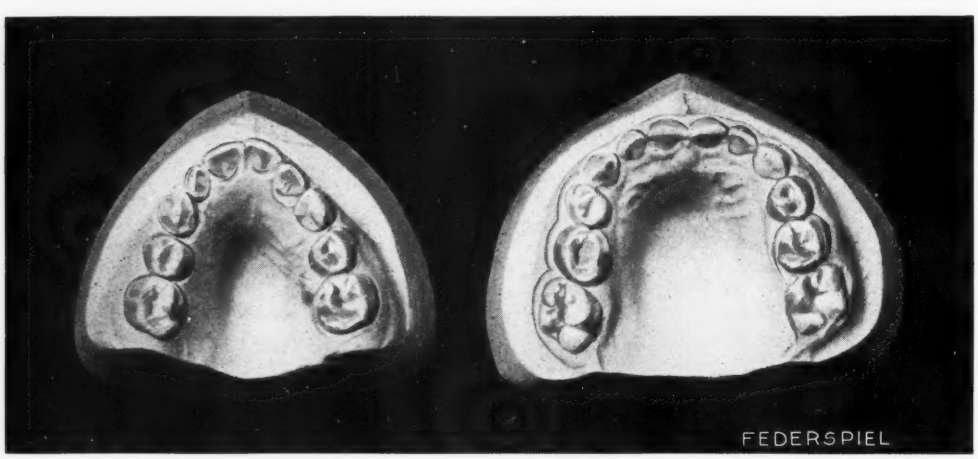
While the above case refers to patients manifesting malocclusion during the eruption of the permanent teeth, let me call the reader's attention to the fact that it is important to give due consideration to the dental arches before the permanent teeth erupt. It is also important that dentists *get*

the habit of recognizing abnormal development of the dental area and the adjacent structures. I do not refer to the decay of the baby teeth alone, but to the relation of the position of the teeth and arches, and the importance of looking for any pathological conditions that may exist in the nose, such as enlarged adenoids, tonsils, deflected septums, hypertrophy of the turbinates, etc. This is very important and I cannot urge dentists too forcibly to give this matter serious consideration.



A. B.

Fig. 7.—*A*. Showing malrelation of the arches and malposition of the teeth progressing. *B*. Result after treatment with a normal relation of the teeth.



A. B.

Fig. 8.—*A*. Showing expansion of upper arch to give room for the permanent teeth and to provide room for the tongue. *B*. Result after treatment. Note first permanent molar has erupted. Age five years when treatment was begun.

I desire to call the reader's attention to a very interesting case.

Case 4.—(See Fig. 8.) This patient was brought to me with the complaint that she was a mouth-breather. She had had her adenoids and tonsils removed by the family rhinologist, but this failed to improve her breathing. Age five years. Upper arch very narrow. The removal of the primary condition was necessary; but it did not cure the mouth-breathing,

because the contracted arches did not permit enough room for the tongue when the mouth was closed. In this case the upper arch was widened. This procedure gave plenty of room for the tongue when the mouth was closed and permitted normal nasal respiration.

Nasal stenosis in early childhood usually produces damaging results to the dental arches, which leaves considerable contraction. It is therefore necessary that orthodontic treatment should be administered at this time in order to give plenty of room for the tongue when the mouth is closed and to provide sufficient space for the normal eruption of the permanent teeth.

The benefit derived from such treatment is difficult to appreciate. It is of the greatest value and might be called preventive orthodontics.

To recapitulate, I have the following to say:

1. That nasal stenosis usually produces contracted arches of deciduous teeth.

2 That the remedying of nasal stenosis will not cure mouth-breathing if the deciduous arches are contracted.

3. That the rhinologist and orthodontist must co-operate in giving relief to nasal stenosis complicated by contracted arches.

4. That expansion of contracted deciduous arches will help to prevent the permanent teeth from erupting abnormally.

5. That the malocclusion of the teeth should be corrected during the period of tooth eruption.

6. That the prognosis of orthodontic treatment during the developmental stage is favorable.

7. That the postponing of orthodontic treatment until after the permanent teeth have erupted may then be unremediable.

MALOCCLUSION OF THE TEMPORARY TEETH.*

By Angelo Chiavaro, M.D., D.D.S.
Official Professor of Dentistry in the Royal University of Rome.

IN THE dental dispensary of the Royal University of Rome, and in my private practice, I have noticed that the malocclusion of temporary teeth is far from being uncommon.

Since 1900, E. A. Bogue, of New York, has been of the opinion that "the position of the deciduous teeth affects the permanent teeth, and that therefore any irregularities in the deciduous teeth should be corrected, in order to prepare the way for the permanent teeth"**; and in 1908, he wrote, that "if irregularities are found in the deciduous teeth, irregular ties of the same nature, but still more pronounced, may always be expected in the permanent teeth, which are to follow these deciduous teeth."†

The eminent Edward H. Angle, discussing a paper of Frederick L. Stanton, upon "Distal Occlusion of the Deciduous Teeth"‡ repeated, what

*Reprinted from the Transactions of the European Orthodontia Society. Sixth Annual Meeting, London, May 11 to 14, 1913. Edited by the Oester-Ungar, Vierteljahrsschrift fuer Zahnheilkunde, Vienna.

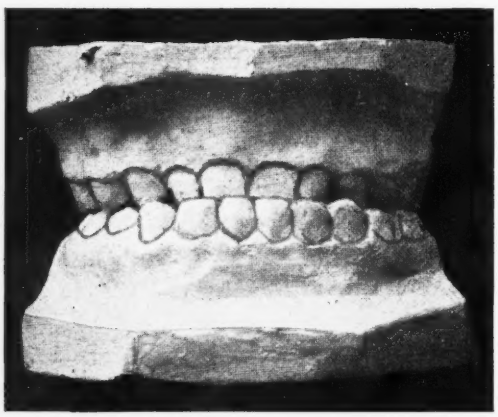
**"Theories Made Facts," The Journal of the Allied Societies, October, 1906.

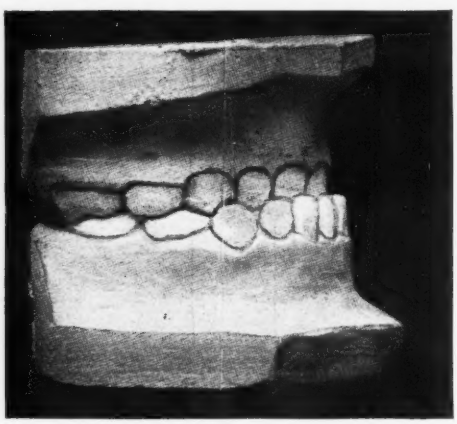
†"Some Results from Orthodontia on the Deciduous Teeth," Journal of the American Medical Association. January 25, 1908, Vol. I. pp. 267-269.

‡The American Orthodontist, October. 1910.

he has often written, that for treatment of malocclusion "the early age is the golden age." The greatest point in all our work is to set nature working rightly as early as possible. Who can doubt the mandible will be more normally developed and the face better balanced if taken early instead of waiting until eight or ten years of age?

Few members of the dental profession still believe that it is useless or dangerous to correct temporary teeth in malocclusion, because their movement cannot bring in the right position the germs of the permanent teeth and might also injure them; but the majority, if not all, of the orthodontists, I am sure, will agree with me in stating that:





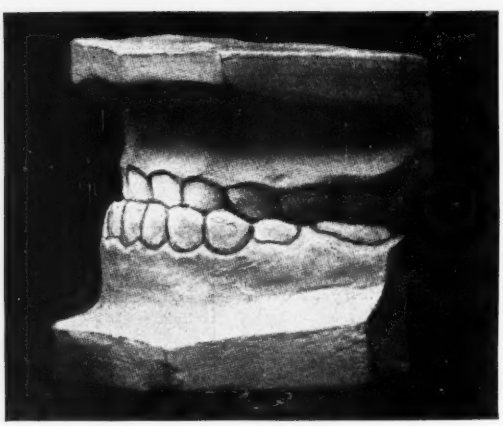


Fig. 1.—L. C., age five years. Class I with lingual occlusion of the upper front teeth and lingual occlusion of the upper left posterior teeth.

1. Almost all of the irregularities known in the occlusion of the permanent teeth could be found also in the temporary ones.

2. To the malocclusion of temporary teeth necessarily follows the same, but more pronounced, malocclusion of permanent teeth (Fig. 9).

3. The earliest correction of the malocclusion of temporary teeth is the best practice.

I thought it would be of some interest to submit for discussion of the European Orthodontia Society a study upon the important subject of malocclusion of temporary teeth by reporting how and what I found in my researches in order to answer these three questions:

1. If the three classes of malocclusion of the permanent teeth with their divisions and subdivisions are really all found in the temporary teeth.

2. The percentage of malocclusion in temporary teeth of some of the children belonging to Rome, the capital of the land, the citizens of which are thought to have beautiful, sound and regular teeth.

3 The percentage of each of the three classes of malocclusion of the temporary teeth of a certain number of children.

I started examining the teeth of the children between three and six years of age in the Children's Hospital of the "Holy Child" in Rome; they were 160.

By this first examination I learnt that the easiest way of examining is

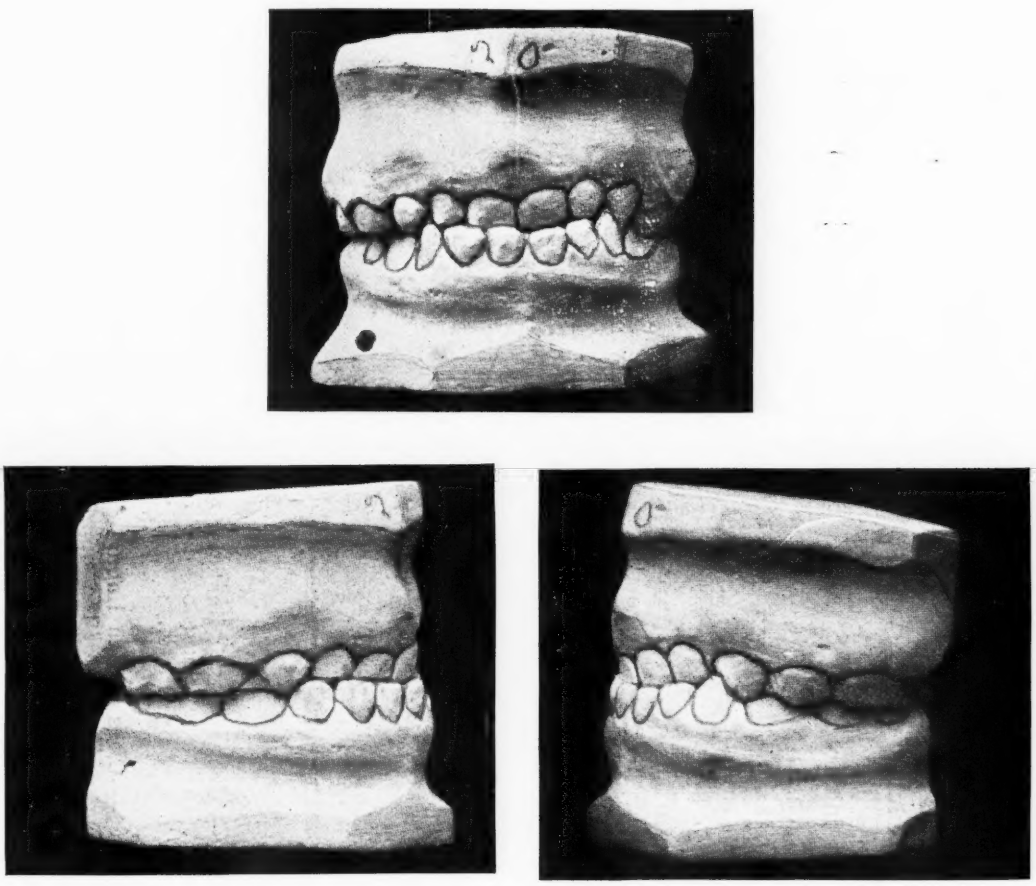


Fig. 2.—A. C. B., age five years. Class I with lingual occlusion of the upper anterior teeth.

to look at the mouths of the children without instruments, asking them to open the mouth, taking note of what is important and helping them to close the teeth in their right occlusion; then gently removing the lips for examination of the occlusion.

I could have continued my work by examining other children's hospitals of Rome, but I was lucky enough to have the permission of the Lord Mayor of Rome to examine without instruments the teeth of the children of the kindergartens, which gave me a very large supply of material. The numerous children of the municipal Roman kindergartens are divided into three classes; in the first class are children from 3 to 4 years old; in the second

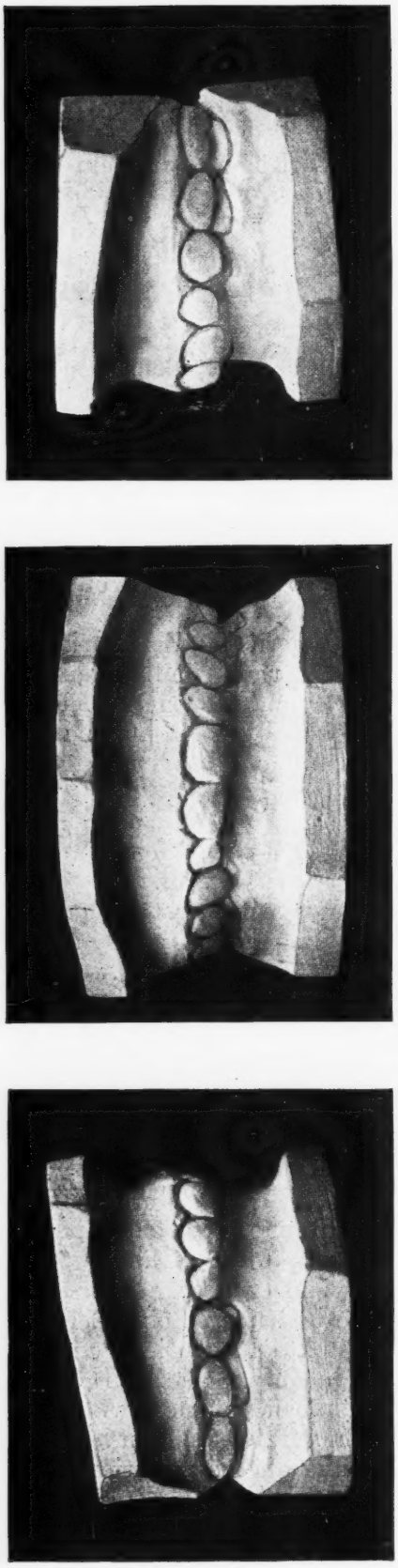


Fig. 3.—R. A., age four years and two months. Class II, Division 2.

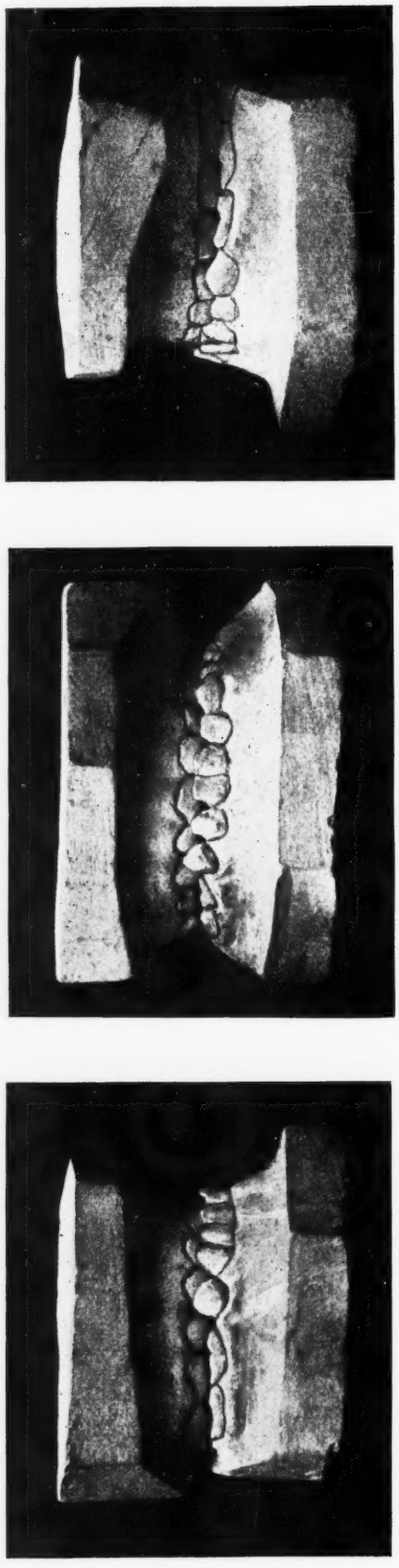


Fig. 4.—S. P., age three years and six months. Class III, Division, with lingual occlusion of all of the upper teeth.

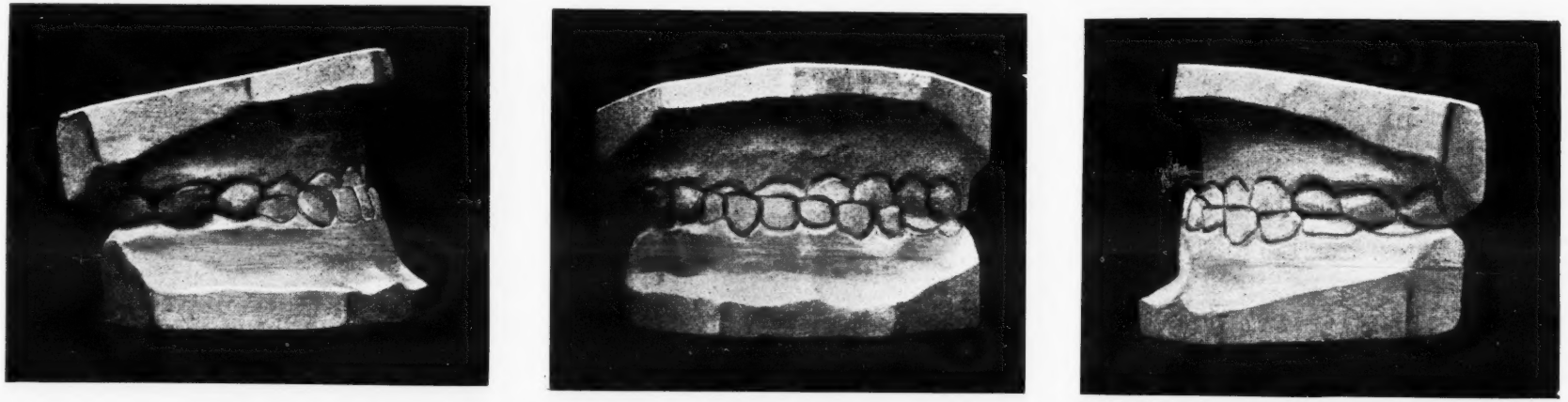


Fig. 5.—G. B., age four years. Class III, Division, with lingual occlusion of the upper front teeth.

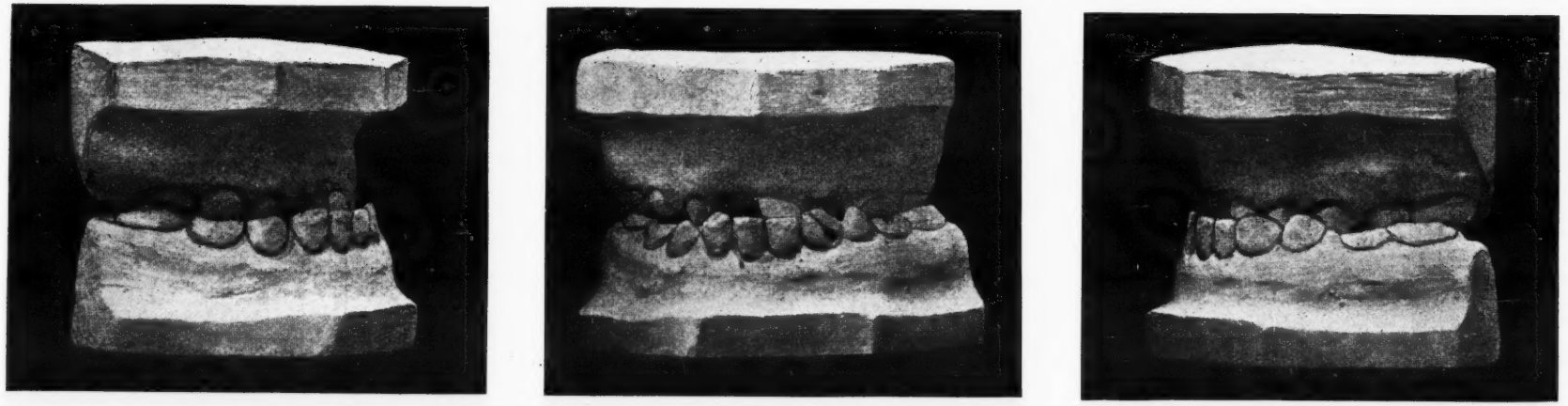


Fig. 6.—B. D. A., age four years and eight months. Class III, Division, with lingual occlusion of the upper front and left posterior teeth.

from 4 to 5 years old; in the third from 5 to 6 years old. In the classes are both males and females.

I am sure that the public kindergartens and elementary schools offer the best field for inspection and study of malocclusion of temporary and permanent teeth.

As you can see from my record book, I examined the mouths of one thousand children: some of them, as I said, sick in the hospital from medical or surgical diseases; some from the best class of citizens belonging to private kindergartens; some belonging to kindergartens of the poorest quarters of the city; and some belonging to kindergartens of the middle-class quarters.

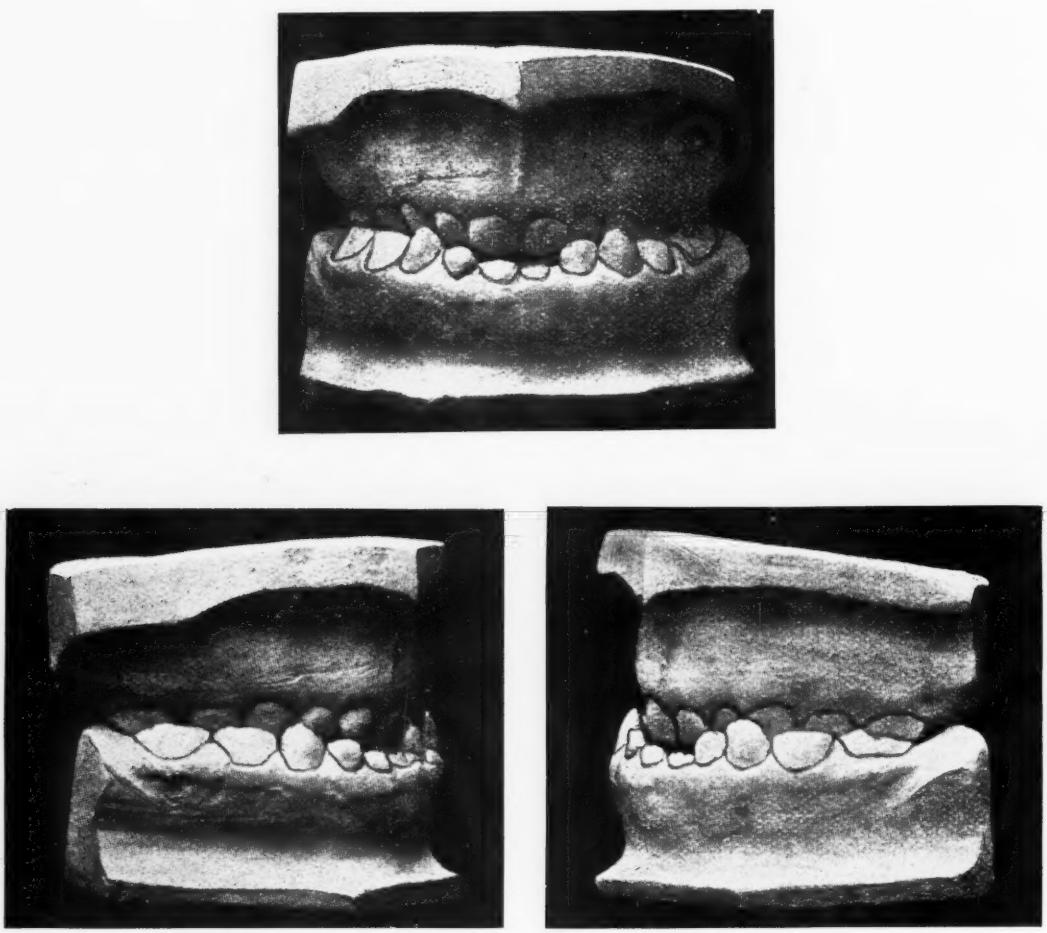


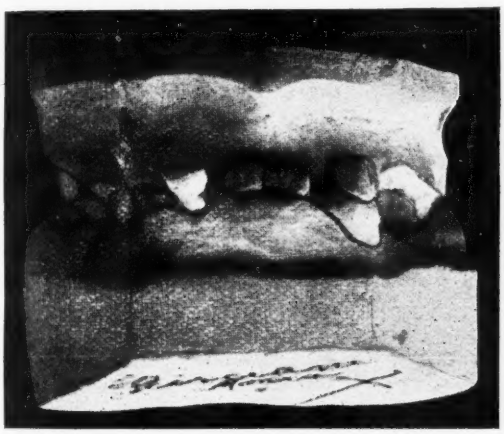
Fig. 7.—P. M., age five years and eight months. Class III, Division, with lingual occlusion of all the upper teeth.

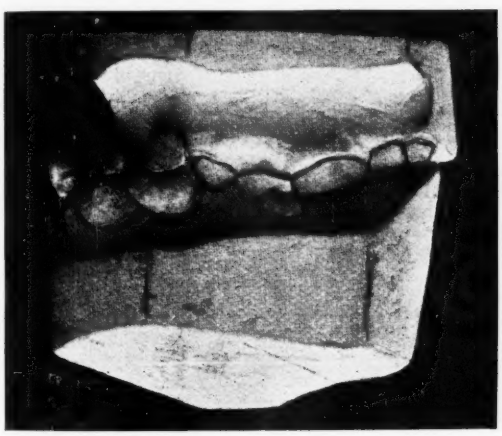
I have considered as belonging to Class I all the irregularities of teeth when the second temporary molars occlude normally mesio-distally: in this class I have included cases with frenulum labii as the cause of diastema, abnormal lower central diastema, crowding of anterior teeth, vestibular buccal occlusion of lower molars, lingual occlusion of upper molars, labial occlusion of lower anterior teeth, torsion of teeth and all cases of normal mesio-distal occlusion, in which, from thumb or lip sucking, the upper front teeth were in protrusion, and the lower anterior teeth were in retrusion, and

all the cases of infra-occlusion of anterior teeth (mordex apertus), which in general is due to the habit of keeping the tongue between the anterior teeth (Figs. 1, 2 and 8).

I have put in Class II the cases in distal occlusion with divisions and subdivisions (Fig. 3) and in Class III the cases in mesial occlusion with division and subdivision (Figs. 4, 5, 6, 7 and 9).

I have found a good many cases of Class II with anterior teeth neither in labial inclination nor in lingual inclination, that is, they were in proper vertical position.





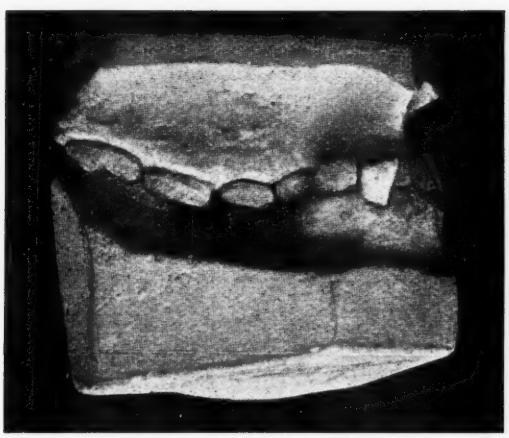


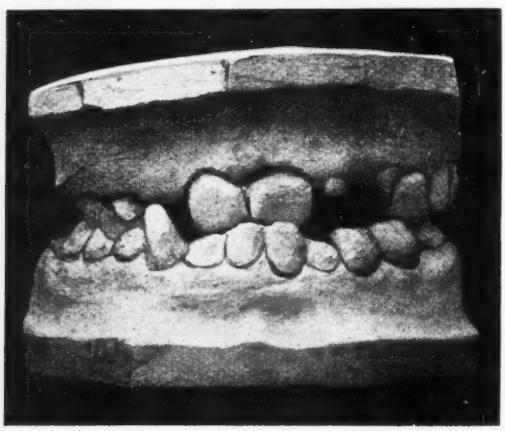
Fig. 8.—S. M., age six years and two months. Class I, with lingual occlusion of the upper anterior teeth, showing that, in spite of the early extraction of the four lower temporary molars, the first permanent molars are in normal mesio-distal relation.

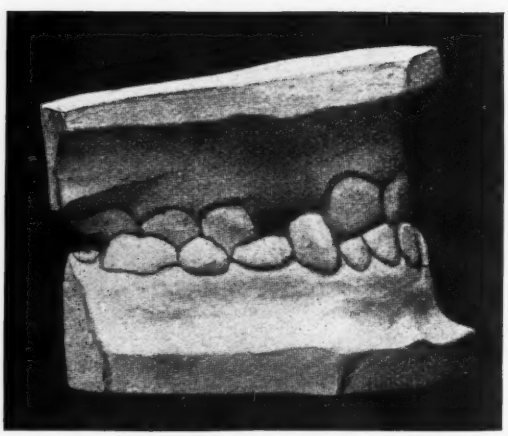
It is unnecessary to point out that I have been very careful in seeing that the little children have occluded their teeth in proper position, as every one of us knows that the majority of them, if asked to close their mouths, usually carry forward the lower jaw, as to simulate Class III, if one does not control the right occlusion by making them swallow, while they occlude, or by palpation of the temporo-mandibular articulation.

I have found 289 cases of malocclusion in 1,000 children between 3 and 6 years old, which means about 30 per 100.

These 289 cases are divided as follows:

Class I		222
Class II	22	
Class II, Division 1	11	
Class II, Subdivision	2	
Class II, Division 2	1	
Class II, Subdivision	5	
Total, Class II		41
Class III, Division	16	
Class III, Subdivision	10	
Total, Class III		26
Total of all cases of malocclusion		289





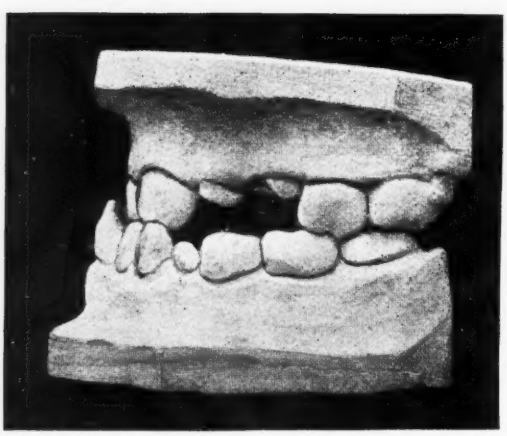


Fig. 9.—C. A., age seven years and eight months. Class III, Division, with lingual occlusion of the upper right posterior teeth, showing that, if the temporary teeth are in malocclusion, the permanent ones also erupt in malocclusion.

I have noticed that in about one-half of the children near six years of age their anterior teeth were not at all spaced, but they were in proximal contact one with the other as in children three years old, so that one might

think that later the permanent ones could not find room enough and would erupt in a crowded position.

Dr. H. Chapman in his work on "Occlusion of the Temporary Teeth and Its Bearing on Class II Cases"* remarked that if "the temporary molars at the age of five years present their distal surfaces in the same place—or very nearly so—it is impossible for the first permanent molars to come into position and occlude normally."

I found that cases with second temporary molars with their distal surfaces in vertical position are numerous, but the malocclusion of the first permanent molars did not always follow in consequence, because in many children of six years, who had already erupted their four first permanent molars and at the same time had the temporary molars all sound and in the position indicated by Dr. Chapman, I noticed that the first permanent molars were in right occlusion, if their breathing was physiological.

The premature loss or extraction of the temporary molars, generally indicated as a cause of malocclusion of permanent first molars, does not always cause such irregularity, because in some cases I noticed that, though the temporary molars had been extracted some time before, the first permanent molars were erupting or erupted in right occlusion, but of course probably these cases would belong in future to Class I for the crowding of the teeth anterior to the permanent molars. (Fig. 8.)

I found 36 cases (3.6 per cent) of abnormal upper frenulum labii and 17 cases (1.7 per cent) with diastema between the two lower central incisors.

From what I have seen in my inspection I conclude that all the irregularities known in the occlusion of the permanent teeth can be found also in the temporary ones, except teeth erupted in the palate or in the alveolar labial region.

The great number of irregularities of temporary teeth (28.9 per cent) confirms the necessity of the early inspection of the mouths of children between 3 and 6 years old with the purpose of regulating their teeth when necessary, which could be done in a short time and would prepare the jaws for receiving in proper position the permanent teeth, avoiding more pronounced irregularities of them, and diminishing the number of cases of malocclusion of permanent teeth.

*The American Orthodontist, October, 1910.

NOTES ON THE EARLY TREATMENT OF MALOCCLUSION.*

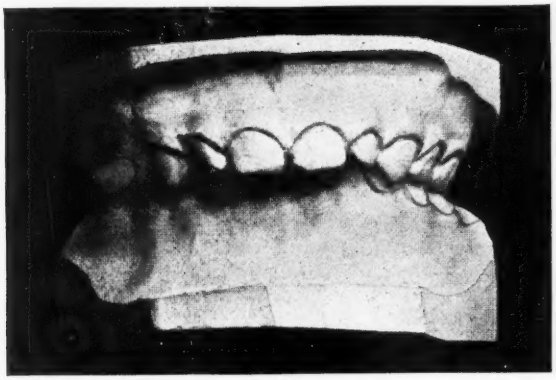
By P. J. Coebergh
Lecturer in Dentistry at the University of Utrecht.

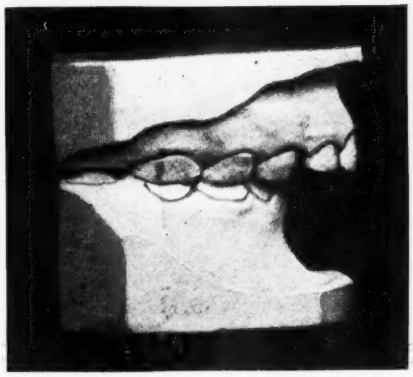
THE knowledge of the treatment of irregularities of the teeth at the age when no permanent teeth have erupted is still fresh in the minds of those who have tried to perform such treatment. We do not find in the textbooks and periodicals much explanation, and therefore I think such a meeting of specialists as this makes it possible to obtain some explanation by inviting a discussion on the theme I have chosen. I will endeavor to invite that discussion in the most courteous way by giving you first some notes of my knowledge and experience, thus making it certain that you shall have some matter at least to discuss.

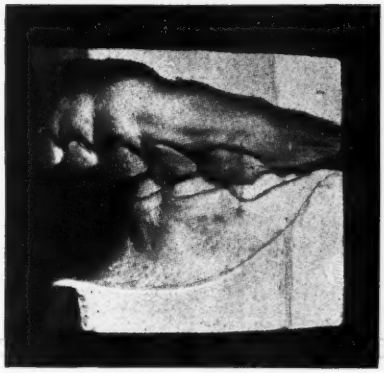
It is no wonder that the early orthodontic treatment, especially of the temporary denture, shows no sign of development. The fundamental principles of this department of orthodontia, as to the anatomy of the temporary teeth, the form of arches, the physiology of the first and notably of the second dentition, must still be subjected to much deeper research before a reliable system of treatment can be based on these fundamental points. But the experiments made by a careful and conscientious treatment may be also a help in discovering these fundamentals. In addition to that, there are many bad cases of abnormalities of the temporary set that cry for treatment. These two points are already enough to justify experimenting. After we have studied the case in the mouth and from the models, we can form a plan for rational treatment. We must especially take into account the age and health of the patient. To my mind, it is not good to begin the treatment of the temporary set after four and a half years, because, in such cases, we have to try and finish the case before one of the temporary teeth begins to loosen. The second stage is that in which we can begin treatment, with some exceptions, when the four lower and upper temporary teeth have been succeeded by the permanent ones. We should never begin treatment of a child that is not healthy enough to endure the drawbacks of the appliances we have to use, especially as we have always to take into consideration that many children are able to endure a good deal of suffering without saying a word or shedding a tear, until the moment comes when the little patient is exhausted. Possibly, we are then halfway towards success, but we have to stop and there is consequent disappointment for everybody —the child, the parents, and the dentist.

Of course, you think that we should so arrange our treatment that the patient does not suffer. That is quite right; but I have heard of and seen too many cases where the treatment was not in the hands of a well known practitioner. On this subject, experience must be international, as it is with so many other questions. The best advice I can give, when taking charge of the treatment of young children, is that we make a very exact study of the case, put on the appliance, in parts very carefully, and go on with the treatment as slowly as possible.

*Reprinted from the Transactions of the European Orthodontia Society, Sixth Annual Meeting, London, May 11 to 14, 1913. Edited by the Oester-Ungar. Vierteljahrsschrift fuer Zahnheilkunde, Vienna.







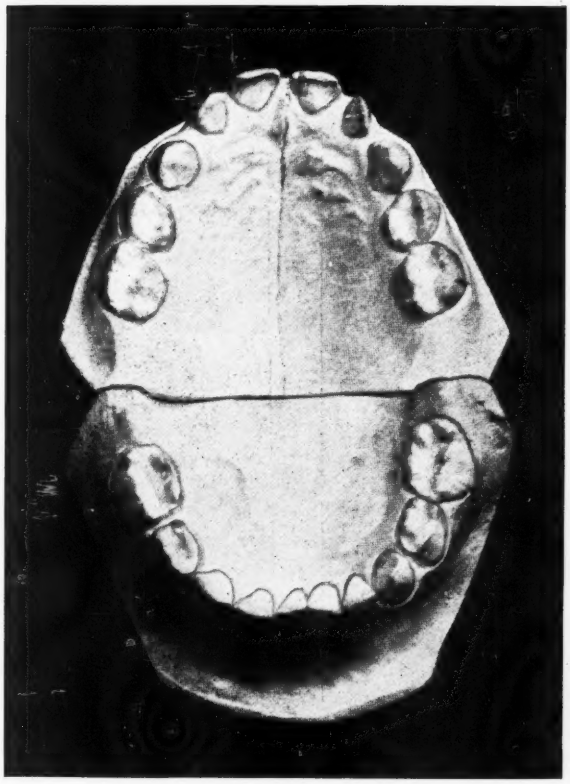
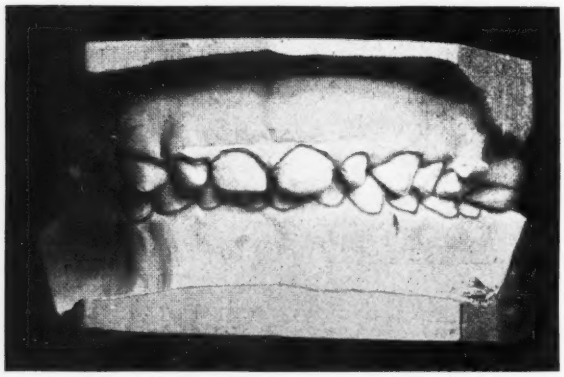
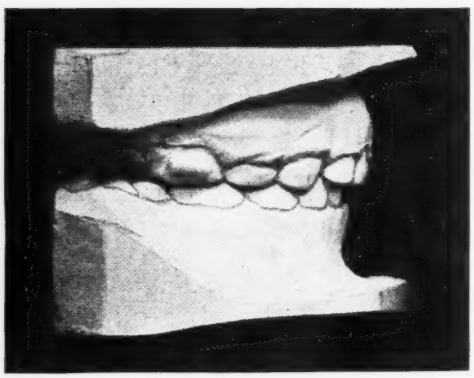
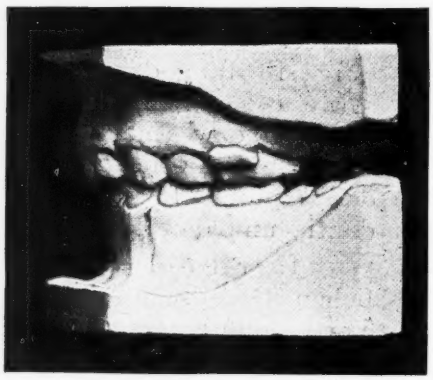


Fig. 1 —Models of case before treatment.







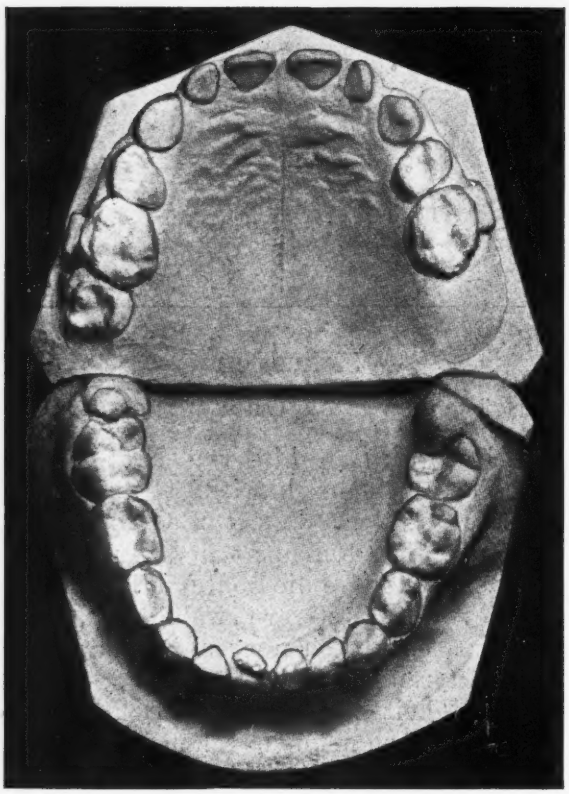


Fig. 2.—Models of case after treatment.

If we make use of Angle's expansion arch, we have to fix a sort of anchorage for it. The temporary teeth are not built anatomically to be banded with anchor-screw bands, and therefore we have to rely on plain bands, forming them on the teeth in the mouth. They must be of great accuracy. The second temporary molar is not implanted strongly enough for us to rely upon it as an anchorage tooth. That this is true has been shown in periodical

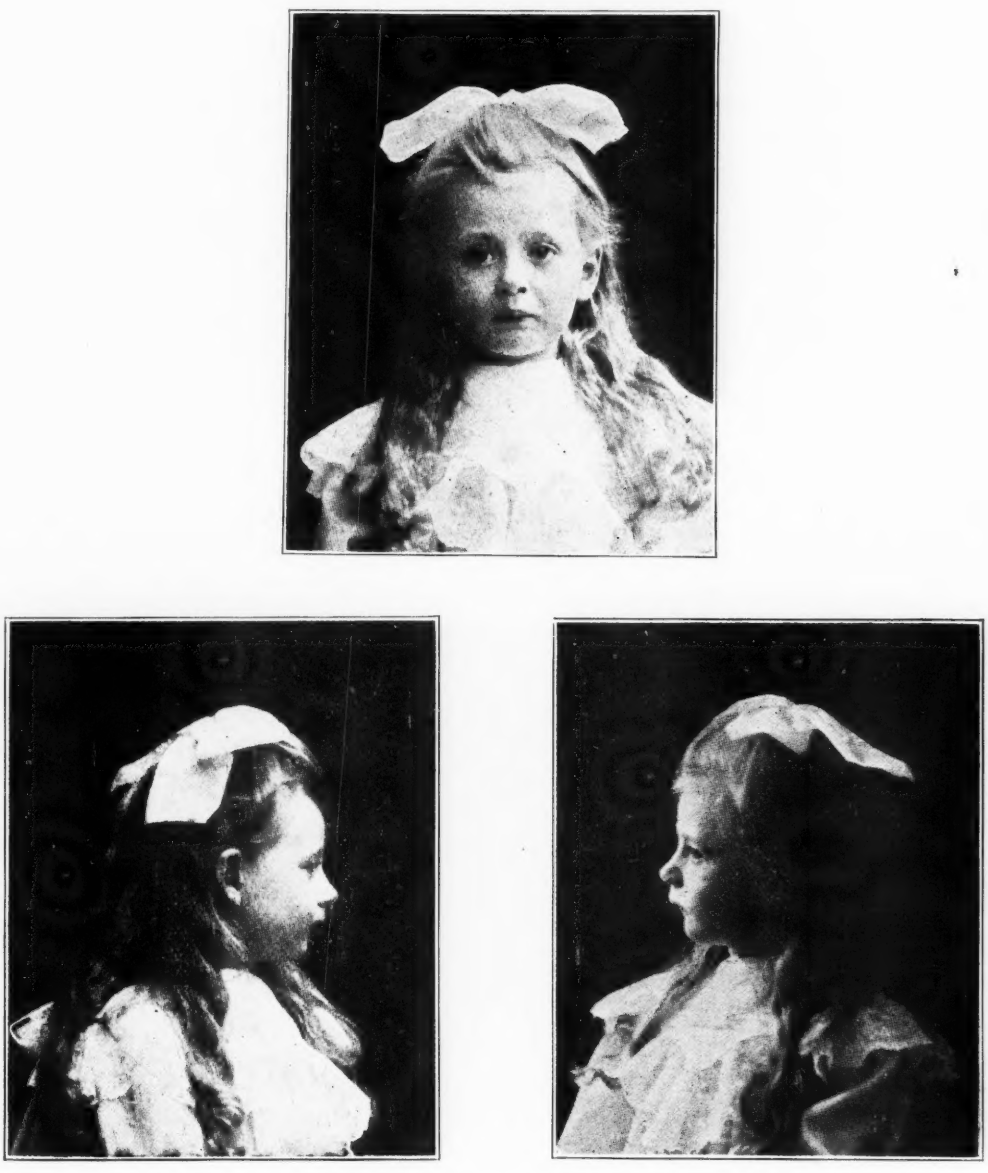


Fig. 3.—Photographs of case before treatment.

literature, because we find in the journals of the year 1910 a report of investigations made in America, as well as in Germany, by the use of a sort of stationary anchorage for the treatment of temporary dentures. Many practitioners followed this idea, although using different and not always improved methods.

Therefore, we have now two methods of anchorage, the first of which is

as follows: We band the second temporary molar and cuspids with plain bands, and solder a piece of wire, gauge 18, to the lingual side of the molar and cuspid bands very near to the gums. The buccal side of the molar band has the ordinary tube for the receipt of the expansion arch.

The second method is as follows: We use the same bands, but we solder a very short tube to the mesio-lingual side of the second temporary molar,

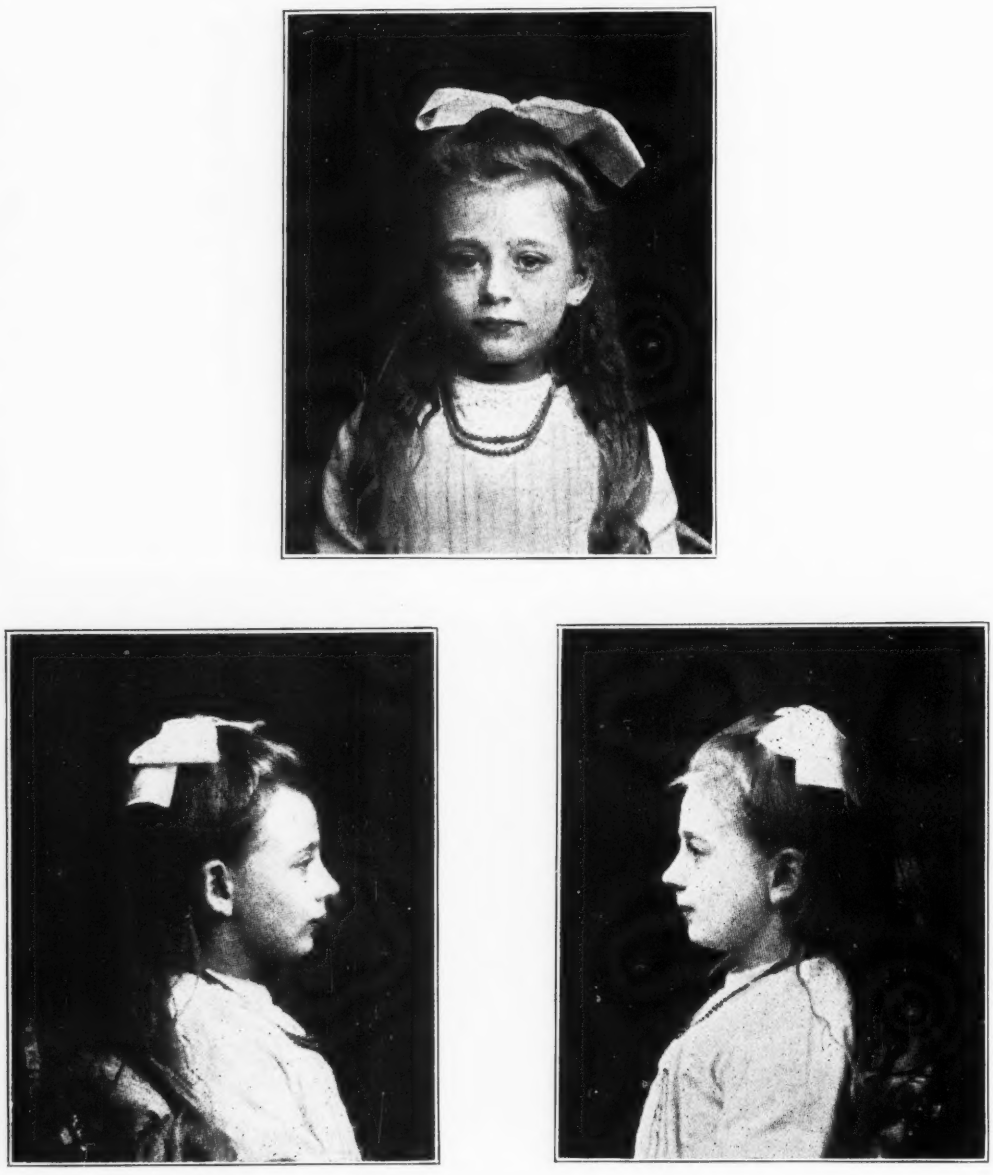


Fig. 4.—Photographs of case after treatment.

with the opening to the occlusal plane and near to the gum. Then we bend a double hook from a piece of 18-gauge wire in such a way that it can be hooked in the small tube of the molar band. We put that in its place and cut off the other end of the wire so that it can be soldered to the cuspid band on the lingual side. Thus we have hinged attachment. We then solder the tube for the expansion arch to the molar band on the buccal side. When

this work has been done and finished, we have to put on the appliance, cement the molar band with the tube on the second temporary molar, then fix the hook of the wire in the tube and cement the cuspid band. It is unnecessary to tell you that all the soldering work is done on a model taken from an impression of the teeth with the bands *in situ*. All the work has to be done and finished in an excellent manner.

With both the first and second methods we avoid the ligaturing of the temporary teeth themselves to the expansion arch, because we have the opportunity to put our ligatures round the lingual wire and between the interproximal spaces to the expansion arch. But the second hinged appliance is to be preferred, as we have a better control over the second temporary molar, coming fully under the expansive power of the expansion arch and the first temporary molar coming under the working power of the ligatures. This hinged appliance was an original invention made by Korbitz, of Berlin, in 1910. I have had considerable success in using this appliance and I have no doubt that many practitioners present have already used it themselves.

Possibly you will expect me to give you the lines of treatment for different cases, but that is impossible now because I have not had enough experience with different kinds of irregularities of the temporary denture to give any information of value. I should like, however, to put it forward as my conviction that it is very useless to drive the upper or lower temporary incisors forward, because all that is done in that way is lost time. The amount of expansion or forward movement brought about in that region of the incisors is misleading because the permanent incisors lying still in the jaw-bone do not follow your command. On the other hand, it is possible by a very slow process to move the temporary incisors lingually owing to the fact that the permanent teeth lie behind the roots of the temporary teeth. This is a great benefit in most cases coming under Class II and Class III of the Angle classification.

The slides I show you of a case I treated beginning with the child at four and a half years and concluding when the child was six and a half years, speak for themselves.

I end my paper with the feeling that I have given you nothing original or new, but you will please remember my first sentence and consider this short communication as an invitation to you to give us a very instructive discussion.

DISCUSSION.*

Mr. Coebergh, referring to Professor Chiavaro's paper, said he was very much pleased with it as it was an excellent paper and it was an honor to the Society that Dr. Chiavaro had come all the way to London from Rome to read the paper. He thought Dr. Chiavaro's conclusions were correct. As Dr. Chiavaro had said, the percentage of deformities found in young children was not so large as in children of an older age, and that pointed to the necessity of treating cases as early as possible. He should like to know why Dr. Chiavaro did not include the cases, in which he saw no spaces between the teeth at five years of age, under the head of irregularities, as such cases had all kinds of irregularities. Even if the occlusion of the molars was normal, at that young age there might come a time when there would be the so-called second class occlusion. It would be a great help to the study of occlusion of the temporary sets to investigate the records which Dr. Chiavaro had obtained

*This paper and the one by Dr. Chiavaro were discussed together.

and which he hoped he would be able to publish. He congratulated Dr. Chiavaro on his investigations and hoped that he would continue with them and thus assist the progress of orthodontia and general dentistry.

Mr. Boelger (Secretary of the Dutch Dental Society) said he agreed so fully with the papers that it was difficult to put forward any points of criticism. He agreed with both the principles and the methods, because if young people were not treated early enough and by the right methods, a good deal of trouble would ultimately ensue. He had discovered that by failure: he had been inclined to wait and wait until he found he had waited so long that the teeth were getting rather loose and did not fully erupt. In one case the time of retention had been rather long, and after the eruption of the permanent bicuspids things went wrong and he was obliged to start again. He therefore fully agreed with the essayists that the treatment should be early and thorough.

Dr. O. Solbrig (Secretary of the American Dental Club of Paris) said he would treat irregularities in temporary teeth as early as possible but would never try to put a band on children. In the first place, it was a very difficult thing to do. The temporary molars were so bulb-shaped that it was almost impossible to fit a band properly under the gum, and the gum might be irritated to a great extent; also it occupied considerable time and was a cause of annoyance to the patient. Any method that would do away with that, he thought, would be welcomed by the practitioner. In such cases he always used cast appliances which accurately fitted the baby teeth, which would include the first and second temporary molars, and made a very stable anchorage, and he found one could operate safely for extension by putting on the extension arch. It was his intention to show the appliances on the following day. It was only necessary to take an impression of the baby teeth and sometimes it sufficed to take only half an impression, which was still easier for the child. On the two halves the appliance could be made by casting. Those cast appliances were of two kinds, one covering the occlusal surface, crowning them as it were, but that crowning had to be done in such a way as to occupy the least possible space under the biting surfaces. If that was objectionable, the cast appliances could be made in such a way that the bite was not interfered with, by inserting a thin piece of platinum-iridium, 20 or 25 per cent; very stiff wire, into the teeth. When the model had been taken the bands could be modelled in wax and the whole thing cast. There was absolutely no strain on the patient except in taking the impression. When the patient came again the appliances were simply cemented in place. He thought that method would be found very useful and would be welcomed by all those who had to treat children's teeth.

Dr. K. A. Davenport said the subject had a very special interest to him, because it had been his privilege or misfortune to treat a great many cases of irregularities in children. He hesitated to express what he wished to say because he did not agree with the essayist on the necessity of starting at the very early age which he gave. In fact, it had become his own method, when he found the second temporary molar well fixed and firm, not to hesitate at all to band it for regulation purposes. He thought the trouble with the essayist's work was that it was too complicated. There was no necessity—in fact, he should say it was a distinct disadvantage—to band the canines as well as the second molars. The same criticism would apply to Dr. Solbrig, if he had understood him correctly, in fastening several teeth together. As far as possible, it was necessary to obtain elasticity so that the teeth could move in their own line instead of being moved collectively. The method he employed for doing that was the method brought forward by Dr. Ainsworth. He had been using the method for five years and a great many of the cases now had changed from temporary to permanent teeth and the resulting articulation was most satisfactory.

Dr. J. Sim. Wallace said he agreed with the early treatment of irregularities, but he did not agree with Dr. Solbrig when he said that it was not wise to commence treatment when the child was not healthy enough to stand the discomfort associated with such treatment, because that involved an idea of treatment that was not in his mind. Treatment of such early cases should be done without apparatus at all; and it should be recognized that it was treatment and important treatment. A friend of his, Dr. Harry Campbell, said, and he believed quite correctly, that he could treat cases of irregularities by sending a child away to the seaside better than some dentists could treat their cases by putting on mechanical

appliances. With that statement he was in thorough agreement. The first thing in treatment was to get the child well enough to bear mechanical treatment, if that was necessary; but as a general rule, treatment in the early cases of irregularity did not require mechanical treatment at all. He had seen models sent from America to show the excellent result of early treatment, and that early treatment was perpetrated on children where no mechanical treatment was necessary, because they were cases which would, in the normal development of the jaw, have given sufficient room for the teeth to erupt normally. With regard to the cause, he believed to a certain extent the cause was known and could be removed. Treatment by mechanical appliances, if the cause was not removed, would still lead to irregularities or relapse. It was absolutely necessary first of all to know the cause of the irregularity before one could expect to obtain anything like the best results. When the cause was known, in fifty per cent of cases mechanical appliances did not seem to be necessary at all. With regard to Professor Chiavaro's communication, he was much impressed by the small number of irregularities that seem to prevail in Rome. He had seen far more marked cases of malocclusion and a far larger percentage of what Angle called distal occlusion in this country. He believed it was due to climatic conditions, as it existed principally in those places where the atmosphere was cold and damp, and he believed that in Italy the atmosphere was quite the reverse. There was another condition that accentuated the trouble and seemed to have increased the amount of post-normal occlusion and mouth-breathing in this country to a tremendous extent, and that was the habit which doctors had at the present moment of advocating that children should sleep with the window open throughout the cold and damp winter. Nothing tended more to block the nose than cold and damp air in the nasal passages, and he had no doubt that that was one of the reasons why there was such an enormous number of frightful irregularities in early childhood in this country, far more and much more marked than Dr. Chiavaro had indicated in Rome.

Dr. J. Quintero said he had been much interested in Professor Chiavaro's paper and thought it was very necessary to get as many records as possible of irregularities in children's temporary teeth. The subject had not been studied closely enough so far, and much more data was required upon the subject in order to cope with the condition later on. Also he thought Dr. Angle's classification was not quite applicable to malocclusions of the temporary teeth. A remark had been made in the discussion that Dr. Chiavaro had not mentioned cases in which the teeth were not separated. That of course would make a separate class, and the same might be true of cases where there was a large diastema above or below between the centrals. He had no personal knowledge of what the proper classification for such malocclusions should be, but since Dr. Chiavaro had made such extensive studies of malocclusions of the temporary teeth, perhaps he might be able later on to discover a proper classification. With regard to Mr. Coebergh's paper, his definition of the appliance was very interesting, but if his memory was correct, Dr. Anema last year in Brussels showed two appliances that were somewhat of the same order. He had had occasion to use them since and had obtained very good results from them. He did not find it always possible to regulate the temporary teeth, and in some cases he had found it advisable to wait, as for instance when there had been a certain amount of absorption of the roots of the temporary molars. In such cases, he had not had good results from the immediate regulation and had therefore found it advisable to postpone regulation in such cases until a little later.

Dr. Fisk (Cambridge) said he did not profess to be an expert in orthodontic work, but he had been very much struck by Dr. Chiavaro's paper and the number of cases given of irregularities in children in Rome. He could not agree with Dr. Sim. Wallace as to the large percentage of children who suffered from irregularities. It was a very important question and there was a great field for investigation, not only the percentage of cases, but also the means of treatment. For some years he had had the supervisions of two schools, containing 1,100 children, the condition of whose teeth he examined, but he could not call to mind the number of irregularities that amounted to anything like thirty per cent. There were children in those schools with magnificent dentitions who had never had any dental treatment. With regard to the younger children, he had been struck with the fact that so few had suffered from irregular dentitions. There might be a good deal in what Dr. Sim. Wallace had said as to the necessity of treatment without the aid of appliances, because the children in the schools he had mentioned had been carefully looked after in resi-

dential schools both from the hygienic and medical side, and they did not show an average of thirty per cent of irregularities.

Mr. Mayo Collier said he appreciated the papers very highly and should be very pleased if the essayists could say what was the condition of the nose in each case which they illustrated on the screen. That would be a complenent to the whole business. It would be delightful, for instance, for Dr. Wallace to be able to get up and say, "There you are, there is a case with the incisors of the upper jaw half a mile in front of the lower incisors and the nose is perfect: What did I tell you—was it not all a question of chewing?" Then if the essayist got up and said that the nasal vestibule was open, that there were no post-nasal growths and not this, that and the other; he should be delighted to come to the meeting and receive the rain of abuse that his theory of negative pressure would call forth (Laughter). The members would say to him: "You took up our time for three-quarters of an hour but there was nothing in what you said." Then he would bow and say he was beaten. But until those facts were placed before the Society, say at the next Congress, he should still maintain there was something in what he had said that morning.*

Dr. de Vries asked whether the wire referred to by Mr. Coebergh was an American 18-gauge wire.

Mr. Coebergh said it was a 1 millimetre.

Dr. de Vries said he did not see any reason why finer wire should not be used, even a 22-gauge which he thought would be fully as efficient as a heavier gauge wire, because he did not see the necessity of making the apparatus so bulky. He believed that in the case of small children the fewer appliances placed in their mouths the better, and if the work could be done with smaller and finer appliances it would undoubtedly conduce more to the comfort of the patient.

Mr. Van den Burgh said a friend of his had made some improvement in the apparatus shown by Mr. Coebergh. Instead of making a bar, he had placed on the arch a piece of copper wire, twisting it round the arch, and brought it out between the cuspids, and then by means of silk ligatures, pulled the teeth to the arch. It was a very easy thing to apply.

The President said Professor Chiavaro's statistics had proved that there were fewer cases of malocclusion in the temporary set than in the adult set. By a clinical observation he himself had come to the same conclusion. He felt bound to oppose Mr. Coebergh's statement that the temporary teeth were unfit for screw bands, because he was using a great many screw bands on temporary teeth. Of course their use meant time and some prudence and some knowledge of the children, but it was possible to do the work and he really believed that a screw band was better. As the treatment of malocclusion of the teeth had not yet been definitely settled, and it was frequently necessary to take out the appliances, he believed it was better to put on screw bands because they were easier to remove. They could be taken of and a little piece soldered on and replaced without much discomfort.

Dr. Chiavaro, in reply, said that with regard to Mr. Coebergh's criticism he had not taken notice of cases which had front teeth without spaces; he had not had time to look up anything, but he remembered that about half of the cases had not only proximal contact but crowded temporary front teeth. What would happen in those cases he really could not say, and he was hoping that the condition might be modified with age and the cases righted. Only time could answer the question Mr. Coebergh had asked. With regard to the statistics of irregularities in the temporary and in the permanent teeth, he found it impossible to say anything, because the statistics given by Dr. Angle dealt with a thousand cases of irregularities while his own statistics dealt with a thousand children belonging to different classes in different parts of the city. The basis of the statistics was therefore different. Dr. Angle had shown the kind of irregularities to be found amongst a thousand irregularities, while he himself had examined the mouths of a thousand children who had both regular and irregular teeth, in order to find the percentage of irregular teeth. He did not know of any other statistics of the same kind. It was necessary that

*Mr. Collier's paper was published in the February issue of the Journal.

the investigation should be made in the same city because the conditions were different in different cities. The climate of Rome was a beautiful one and the percentages there were probably lower than would be found in any other city. No doubt, in England, the percentage would be much higher. He wanted his paper to stimulate those who had time to investigate cases and bring forward statistics of children of their cities. Dr. Fisk apparently did not believe in the percentage, but of course one could not obtain any percentage until the numbers were known. He himself had thought it was a very difficult thing to find gemination of temporary crowns of teeth, but in his one thousand children he found four or five cases of fusion of the crowns of temporary teeth. Therefore it was necessary to have figures before one could say with certainty that a certain condition could be found in a certain percentage.

Mr. Fisk said his percentages referred to children in residential schools under proper conditions.

Dr. Chiavaro said a good deal of work had been done with regard to classification and probably Dr. Angle had said the last word on the subject at present in regard to a scientific classification. Of the three classes put forward by different classifications, he thought the simplest and most general was the one put forward by Dr. Angle. With reference to the remarks of Mr. Mayo Collier, the examination of the nose and the investigation of the hearing and impeded respiration to malocclusion of the teeth opened up a very wide field and a very valuable one. It would be possible by working with a rhinologist in the public dispensaries attached to each school in Rome, to discover the condition of the nose, and as soon as he returned to Rome he would see what could be done in that way. By co-operating with the surgeon who was in charge of the Hospital of Diseases of the Nose and Throat, no doubt it would be possible to find out something which would be of assistance to Mr. Mayo Collier in connection with his theory of positive and negative pressures. With regard to the President's remarks, he was very thankful to find that the President corroborated the figures put forward in his paper.

Dr. K. A. Davenport said that both Dr. Sim. Wallace and himself in speaking forgot to bring forward something that was of importance. About two years ago, before the British Dental Association, Dr. George Northcroft brought forward a very able paper on the subject, and even went so far as to give certain additional classifications for temporary teeth. That paper was published at the time in the British Dental Journal.

Mr. Coebergh, in reply said he had always worked with bands but no doubt Dr. Solbrig could show much simpler appliances, and from what was known about Dr. Solbrig's knowledge of the casting process and dentistry the members might be sure that Dr. Solbrig would produce something which was very good. He did not agree with Dr. Solbrig that it was ever necessary to crown a tooth in connection with the treatment of irregularities. With regard to Dr. Davenport's remarks, he had read communications of Dr. Davenport, but had not been able to obtain the same results with his method, though probably that was his own fault. He was pleased to hear from Dr. Sim. Wallace his remarks on attending to the health of the patients, because it was very necessary to improve the health of young patients before beginning treatment. With regard to Dr. Quintero's remarks, it is of course very well known that practitioners had not very much time to experiment with different methods, and what he had put forward was the one method he had adopted in treating his patients. He might inform Mr. Collier that in the case he had shown the patient was in perfect health, both the physician and the rhinologist stating that there was nothing abnormal. Mr. Collier might say it was possible that the rhinologist was wrong, and it was true that greater rhinologists might be found in the city of London than in a small city of 100,000 people, and from that point of view it was possible there was something wrong with the nose. With regard to Dr. de Vries, perhaps the Doctor might be able to demonstrate a less bulky appliance, but he himself thought that an 18-gauge wire was not too bulky.

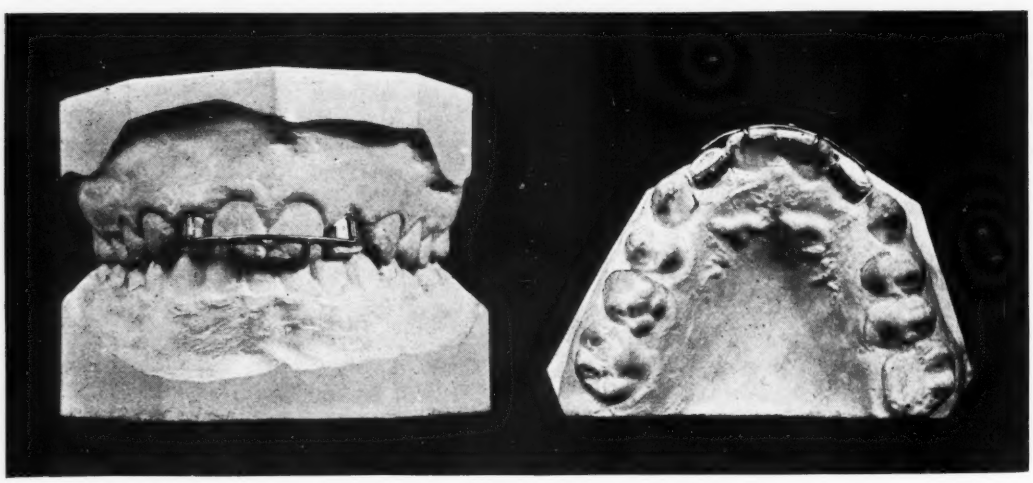
WORKING RETAINER.*

By Dr. Guy B. Steadman, St. Paul, Minn.

PRIMARILY, this appliance is not intended for extensive movement of the teeth. It is most efficient when used as a working retainer. Gold alloy material should be used throughout to obtain the best results.

Use gold alloy band material for the banding of the lateral incisors and solder Angle's arch pin tubes on the labial surface of each lateral incisor band, parallel with the long axis of the tooth.

For the short arch, extending from lateral incisor to lateral incisor, use gauge .030 gold platinum wire. The greatest of care should be exercised in



adapting the arch to the labial surface of the lateral incisors. When rotation is desired, Angle's arch pins should be soldered to the short arch and pushed into place upon the teeth, before adapting the wire which extends over the incisal edges of the central incisors. Great care should be exercised in the adaptation of this wire to the labial and lingual surfaces of the central incisors, and also to the position it should occupy when soldered to the short arch. The wire on the lingual of the teeth should be tapered sufficiently so that it will not interfere with the occlusion of the teeth.

By using this appliance intelligently one should be able to get rotation of the lateral incisors, elongation of the lateral incisors, and root movement in a direction desired. The appliance can also be easily removed, adjusted and replaced.

*Read before the meeting of the Central Association of Angle Graduates, Chicago, November 9, 1914.

PRACTICAL ORTHODONTICS.

A Series of Illustrated Case-Histories from Practice.

NO. 1.

By B. E. Lischer, St. Louis.
Professor of Orthodontics, Washington University Dental School.

ONE need not be a prophet to predict that in the near future our universities will deem it an honor, as well as a duty, to provide such splendid equipments for their dental departments that they will become centers of research, the homes of scholars, a boon to the children of the poor. But until that day dawns it is our duty, as well as our privilege, to encourage *every* educational effort which aims to extend the field of orthodontics. It is a real pleasure, therefore, to assist the editor and publishers of *The International Journal of Orthodontia* in inaugurating a series of illustrated case-histories from practice for the benefit of those subscribers who, for various reasons, have found it inconvenient to take up post-graduate study in the art; are so situated in practice that specialization is impractical; but who are, nevertheless, frequently compelled to administer treatment for malocclusion of the teeth.

History.—Case No. 381, models 302, 302a, 302b, a pale, anæmic girl of nine years, consulted the writer March 30, 1910, for the correction of her malocclusion (Fig. 1). She was referred by the family's dentist and was accompanied by her mother, who related a history of no particular importance. Upon examination, the teeth were found free from caries, no fillings of any kind, but the four temporary cuspids had been lost during the last year. This permitted a linguoversion of the upper and lower incisors, which now encroached upon the cuspid spaces (spelling trouble for the future), and gave the facial expression a slightly flattened appearance in the region of the upper and lower lips. Nasal and lip functions were normal, however, and there was no history of an adenectomy, or tonsillectomy having been performed. The tongue depressor was applied but the throat revealed no abnormalities in the faucial tonsils.

Etiology.—The imposing cocksureness of the average specialist concerning the *cause* of a given case of malocclusion has often aroused my wonder. And in this connection I wish to quote a "wisdom gem" from the great Huxley, which, it has often seemed to me, is particularly appropriate, viz.: "The longer I live, the more obvious it is to me that the most sacred act of a man's life is to say and to feel, 'I believe such and such to be true'."

My record reveals the fact that, regarding the cause of this particular case, I entered no other memorandum than a question mark opposite the heading "Etiology". At first thought, one might suggest premature loss of the temporary cuspids, but it would be interesting to learn *the cause of their early loss*, which might then serve as *causa prima*. It seems to me that we serve truth best if we admit that such local arrests of development as the denture of this child exhibits are difficult to account for.

Diagnosis.—If we examine the occlusion of the posterior teeth on both right and left sides as shown in Fig. 1, we observe a normal mesio-distal contact of the permanent and temporary molars. The decrease in size of the cuspid spaces is entirely due to the disto-linguoversion of the upper and lower incisors. There has been no movement of either arch, in its entirety, upon its osseous base; the arrest of development is confined almost entirely to the anterior, or incisal, regions.

In view of the fact that in this instance we have to deal only with malposition of the teeth and abnormal arch-form, that the arch-relationship is

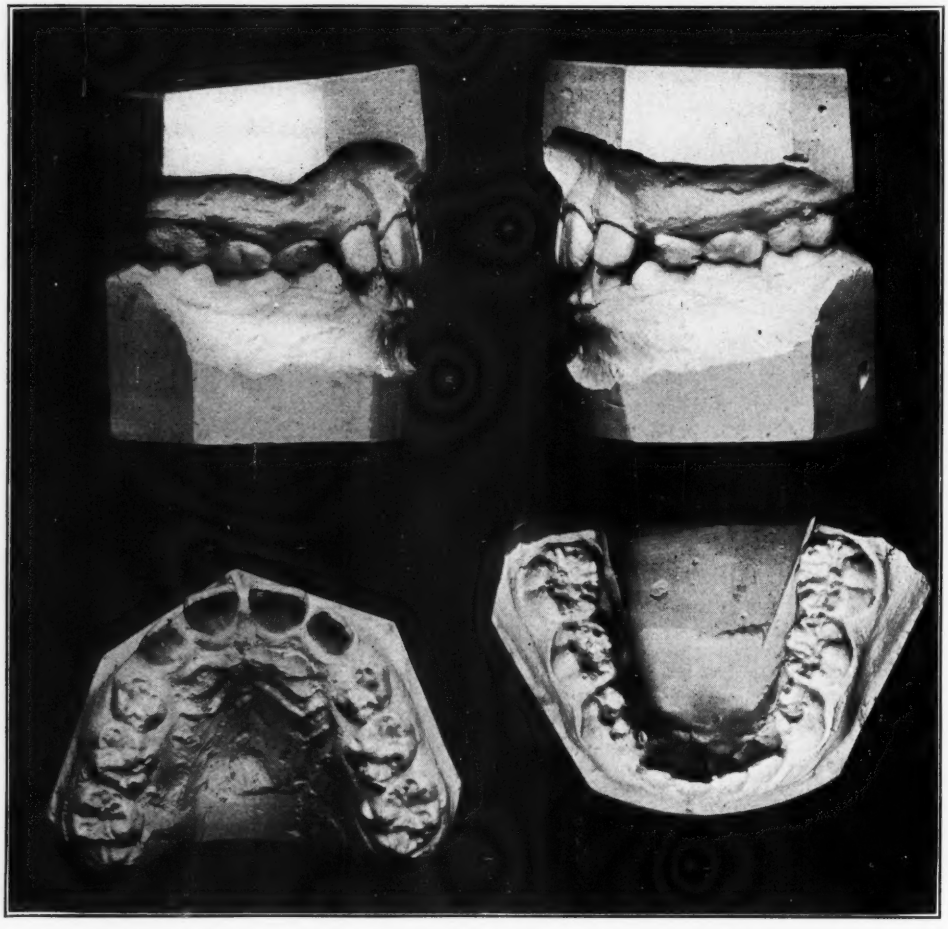


Fig. 1.—Simple Neutroclusion, age nine years. Note linguoversion of the upper and lower incisors, and how this has almost entirely obliterated the cuspid spaces.

normal, or *neutral*, we term it a case of *neutroclusion*. The arrest of development of the alveolar process surrounding the incisors will readily yield to treatment, especially in a child of nine years. And if we restore each arch to normal size and form, an ideal occlusion of all the teeth thus far erupted will be the result.

Prognosis.—Before proceeding with a description of the technical details of treatment it might be well to emphasize the fact that this case is still in its early stages of maldevelopment; that postponement of treatment at this time would be a serious error. The roots and sockets of the incisors

have not been fully formed, which renders their movement easier. Their final formation in normal positions is possible, provided treatment is instituted at once; and such procedure promotes permanency of results. Furthermore, immediate correction will prevent an increase in the severity of the deviations. Fig. 2 shows the models of a case of neutroclusion of the same type at twelve years of age. They also reveal the folly of *waiting* for "time and nature" to exercise a corrective influence.

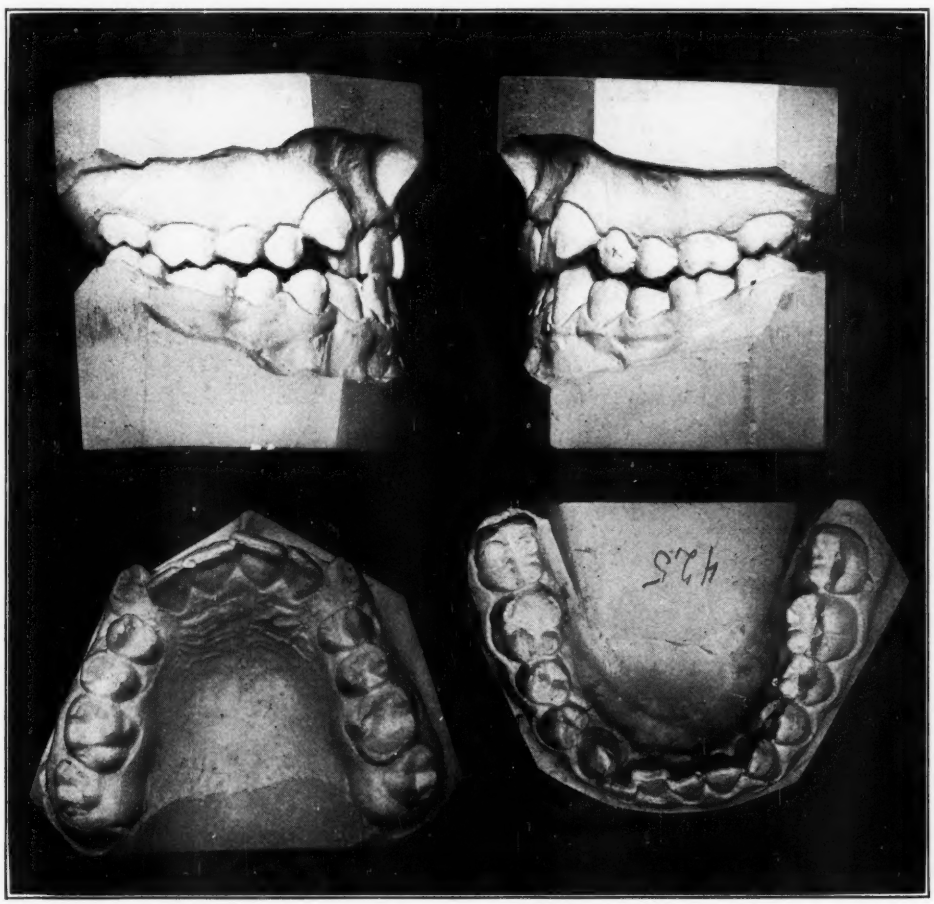


Fig. 2.—Complex Neutroclusion, age twelve years. At nine years this case was less complicated, but decidedly abnormal; three years of "watchful waiting" did not effect a cure.

The prognosis of malocclusion is as unfavorable as it is of caries of the enamel. All dento-facial deformities develop gradually; they do not come over night. *There is a normal type for each mouth at any given age.* The treatment should be instituted as soon as enough permanent teeth have erupted to make it a practical operation, *and should be completed by the end of the twelfth year.* The ideal time to begin treatment in approximately ninety per cent of our cases is between eight and ten years. Occasionally (in very extreme deformities), it is desirable to begin treatment earlier, or during the period of the temporary dentition. Again, it may be best to postpone treatment to eleven or twelve years, depending on the progress of tooth-eruption and general development. One must not follow the

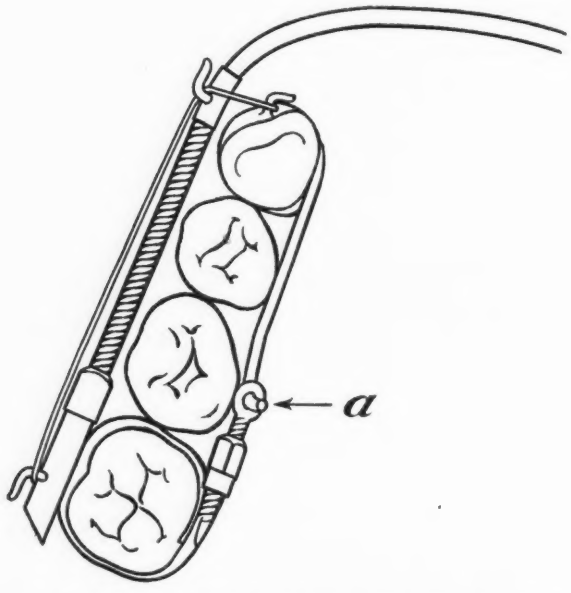


Fig. 3.—Korbitz modification of the lingual extension wires.

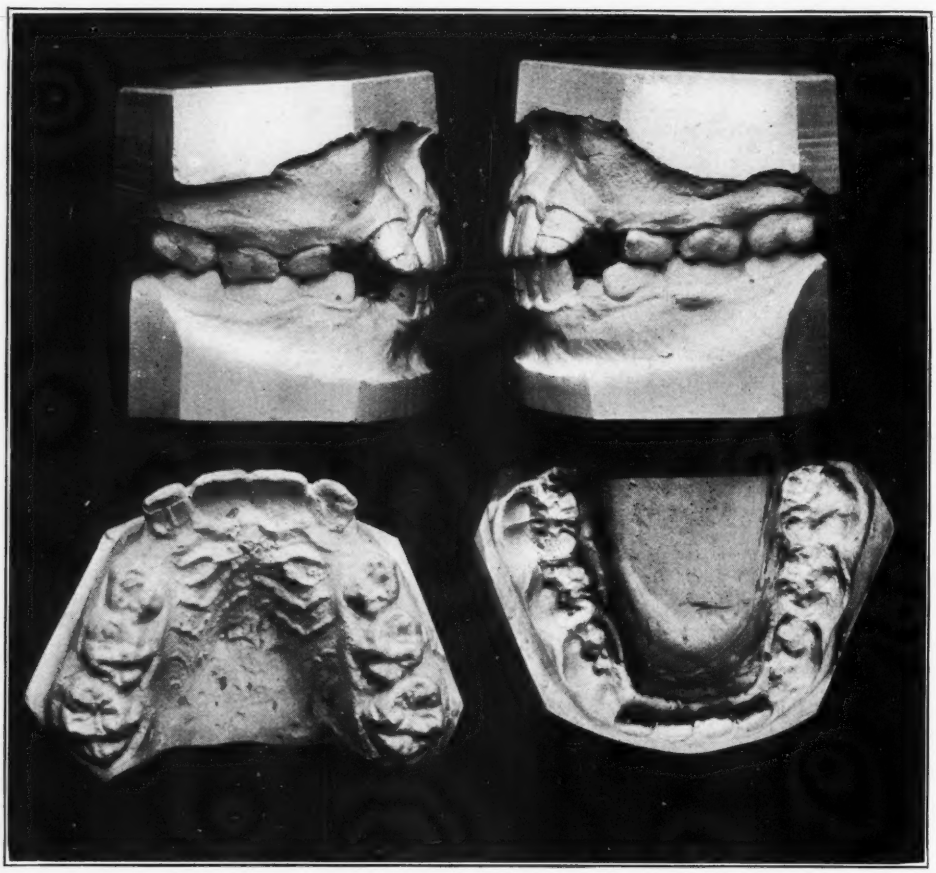


Fig. 4.—Same case as Fig. 1, after two months of treatment. Models made the day post-treatment maintenance appliances were constructed.

calendar too rigidly in a matter of this kind; but the doctor should always be granted the privilege of deciding when it would be *most opportune.*

Treatment.—If the reader will now re-examine Fig. 1, he will note the obliteration of the cuspid spaces. This is due to the linguoversion of the lower incisors and the disto-linguoversion of the upper incisors. And if the development of this denture had been as normal and vigorous as it should be at this age in life, the deciduous cuspids would still be in place, and all of the teeth anterior to the first permanent molars would occupy positions labial and buccal to what they occupy at present. Hence the treatment must aim to accomplish a labial movement of the lower incisors, a labial and mesial movement of the upper incisors, and a buccal movement of the deciduous molars. Any attempt to gain the required spaces for the

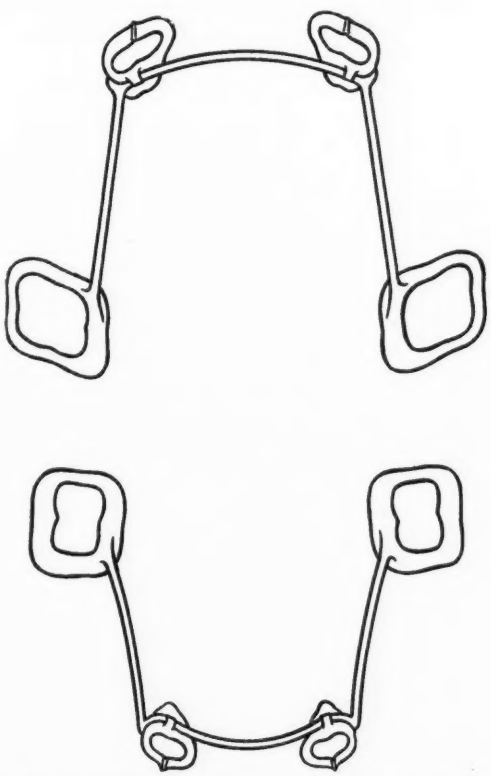


Fig. 5.—Shows design of post-treatment maintenance appliance used on case shown in Fig. 4.

permanent cuspids by only moving the incisors would result in carrying them too far to the labial. Hence the buccal movement of the deciduous molars is indicated; and this promotes the normal eruption of the bicuspids.

To accomplish the various movements enumerated, four molar anchor bands were fitted to the four first permanent molars during four separate visits. After the patient had become accustomed to their presence in the mouth, a morning appointment was arranged for, when four buccal tubes were soldered to their buccal sides and lingual extension wires to embrace the deciduous molars to the mesial were also attached. These attachments must all be carefully soldered and given the proper alignment, so that the entire appliance, when assembled, will become an efficient apparatus. When

in the act of soldering the buccal tubes, their use must be kept in mind, viz.: they must carry or support the alignment wire.

The gauge and design of the alignment wire must be decided upon before the tubes are selected. Some prefer a plain wire of 18-gauge supported by Barnes tubes; others a 16-gauge wire with threaded ends. Personally, for a case like the one under consideration, I prefer an 18-gauge wire with 16-gauge threaded ends resting in plain buccal tubes. But a detail like this is like the selection of a molar band, or a filling material, or an artificial tooth—the personal choice of the operator plays an important rôle. There is no best band or wire, no "cure-all" appliance.

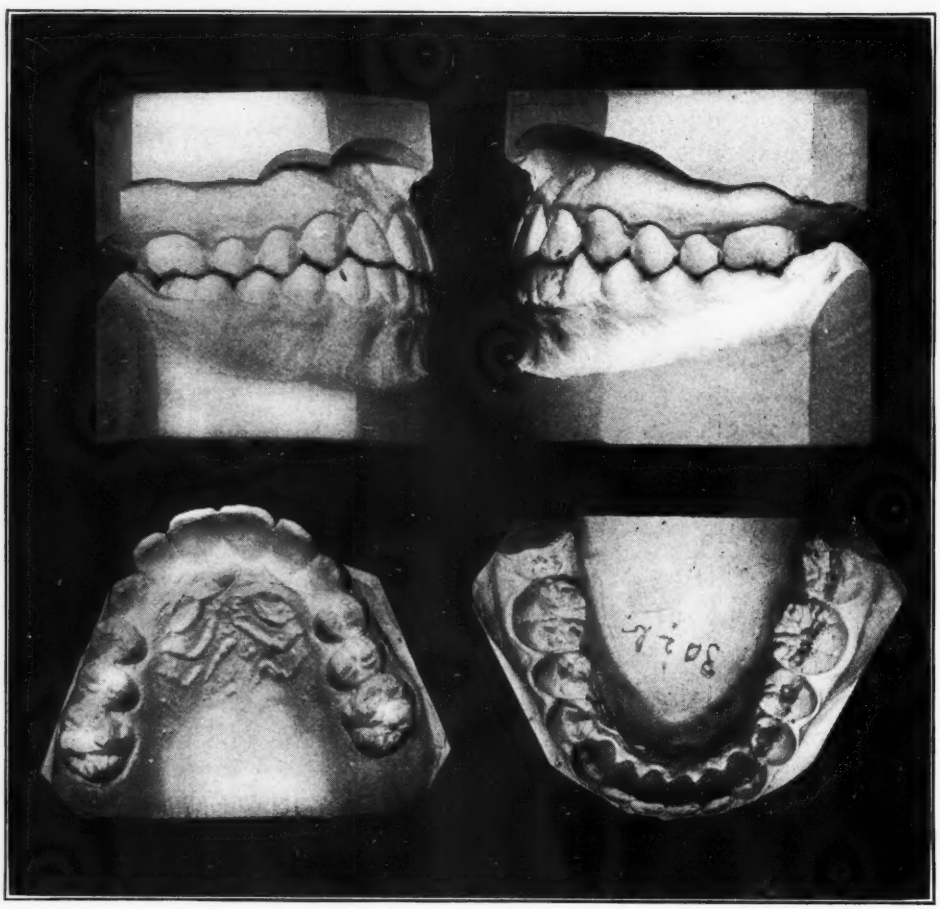


Fig. 6.—Same case as Figs. 1 and 4 two years later, when post-treatment appliances were removed.

The teeth are now thoroughly cleansed and one molar after another is isolated, washed with absolute alcohol, dried with compressed air and the bands set in place with cement. Even if an adjustable clamp band is employed the cement is never omitted, to prevent decay.

Fig. 3 shows the Körbitz modification of the lingual extension wire for buccal movements of the teeth mesial to first molars. Note the hinge joint at *a*. In the case under consideration an eighteen gauge wire was soldered to the free end of the clamping bolt and bent into a hook at the mesial surface of the first temporary molar. This permits the use of but one liga-

ture from hook to alignment wire for moving both temporary molars buccally. The incisors were carried labially and mesially by means of silk ligatures after the lateral incisors had been provided with bands and spurs. These movements were accomplished by weekly visits for two months when the teeth had reached the positions shown in Fig. 4.

Post-Treatment Maintenance.—On June 17, the treatment appliances (except the bands on the lateral incisors) were removed, the teeth again thoroughly cleaned and the post-treatment appliance applied. Fig. 5 shows the design of this mechanism, which consists of four plain molar bands, two nineteen gauge iridio-platinum lingual wires and the bands on the laterals. The lingual wires are soldered to the molar bands, which should be constructed of gold-platinum, or iridio-platinum alloy, .005x.2 of an inch in size, properly festooned and burnished. The wires, as shown, were constructed in sections and united with gold solder, while the patient was seated in the operating chair. The anterior segment of the wires is placed to the gingival of the spurs on the lateral bands, and thus prevented from becoming displaced.

The entire appliance is securely cemented into place and inspected at monthly intervals. As the temporary molars are lost and the bicuspids come to take their places, the lingual wire may occasionally be manipulated with a pair of pliers for the control of their alignment. My record shows that it was worn until April 12, 1912, when the teeth had assumed a position as shown in Fig. 6. Monthly visits were continued during May and June following, and bimonthly visits during the following autumn and winter. On March 12, 1913, the patient was discharged as cured, having made thirty-two visits in all, during the three years of treatment, post-treatment maintenance and subsequent observation.

In a subsequent article the writer will describe in detail the treatment of the case shown in Fig. 2.

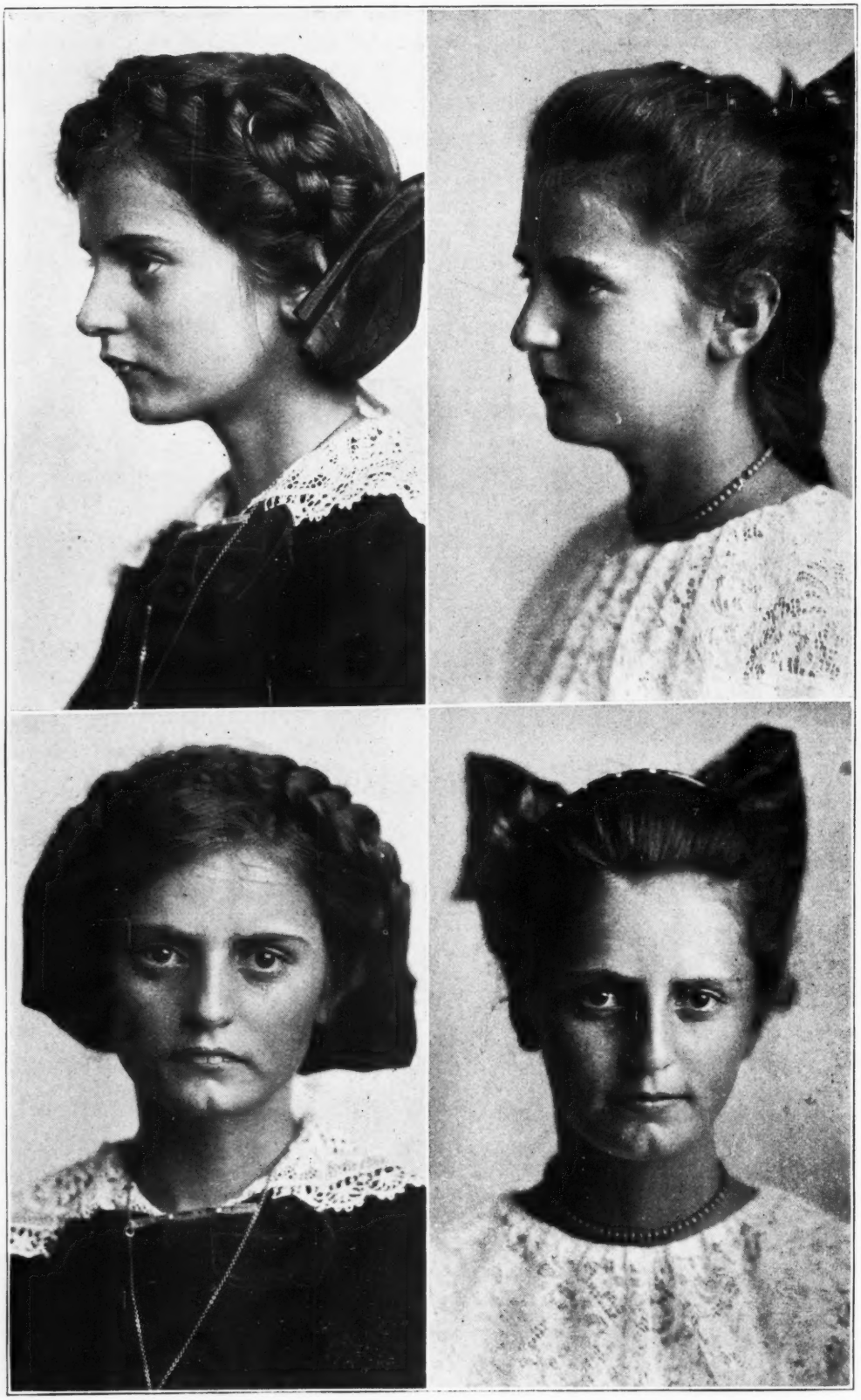


Fig. 1-A. Fig. 1-B.

Case of Dr. R. C. Willett, Peoria, Ill., illustrating before and after treatment.

CASE REPORT

By R. C. Willett, D.M.D., Peoria, Ill.

THERE was nothing unusual in the history or severity of this typical case of bi-lateral distoclusion other than the seeming difficulty under which the treatment was conducted.

The object in presenting the case history and the illustrations is that it may, for the sake of other children so afflicted, encourage other orthodontists to extend their scope of practice instead of reserving their skilled service and talent for the selected few.

The case presented is only a fair illustration of a number treated in a like manner under similar circumstances.

Fig. 1-A is a photograph of the girl, age 13 years and 8 months, taken Nov. 19, 1913, when she was first brought to the office for consultation. Their home was in a small country village some eighty miles from Peoria, and due to railroad connections it was necessary to take two days to make the trip. The mother, having other cares at home, wished no delay in starting the treatment.

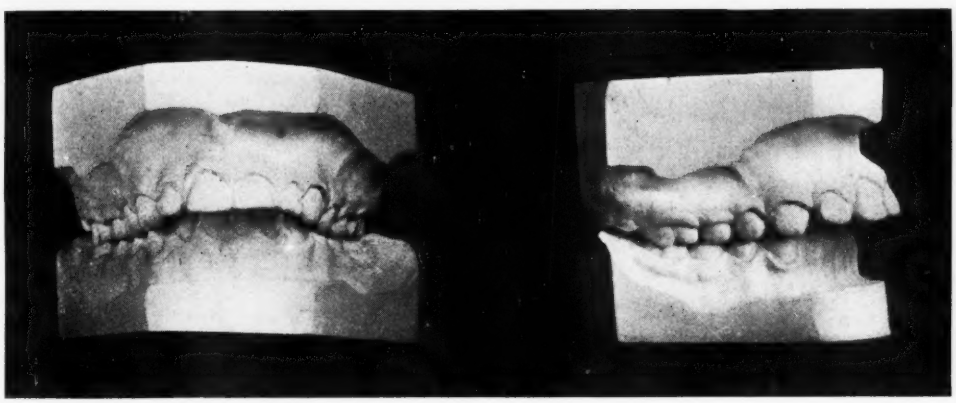


Fig. 2.

Following the recording of the case history, etiology, diagnosis and prognosis, the photographs and impressions were taken.

Fig. 2 shows the first record models of the case.

What seemed to have been a very satisfactory adenoid and tonsil operation had been done a year previous to that.

There was an impediment of speech in which it was extremely difficult for the patient to sound the letters *s*, *x* and *h*.

The plan of treatment adopted was after methods suggested by Angle in what he terms Class II, Div. 1. The appliance consisted of four coutoured adjustable molar bands and two 16-gauge alignment arches. The upper arch was supplied with the intermaxillary sheath hooks.

The appliance was adjusted and the mother instructed in the application of the intermaxillary rubber ligatures. An effort was also made to impress the mother and daughter with the importance of keeping the teeth and

mouth clean, and a demonstration was given as to how this could be done with appliances on the teeth. The patient was then dismissed for four weeks.

The result of the treatment, as you see in Fig. 1-B and Fig. 3, was accomplished in seventeen visits covering a period of nine and one-half months. The seventeenth visit was Oct. 2, 1914, when the final retaining appliance was set. The plan of retention which has proven successful in this case is

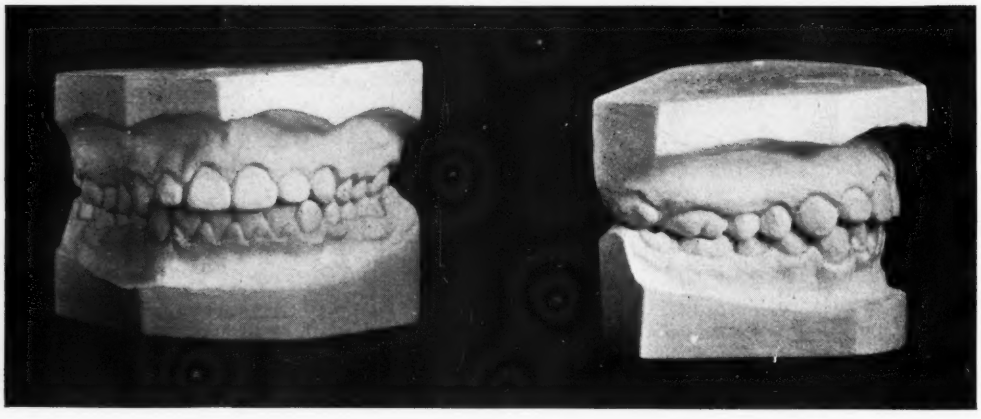


Fig. 3.

constructed after that of Pullen, as illustrated in the "Text Book of Operative Dentistry" by Johnson, Fig. 585.

The impediment of speech was greatly improved. As normal occlusion was established, the patient was drilled in the correct pronouncing of letters, words and combinations of words, in which great difficulty was found at the beginning of the treatment.

CURRENT ORTHODONTIC LITERATURE

EDITED BY H. C. POLLOCK, D.D.S.

Care of the Teeth of Boys in Girard College, Philadelphia.

Bulletin No. 40 of the United States Bureau of Education, compiled for distribution among the officers of orphanages, reform schools and schools for the feeble-minded, and other schools in which children are detained.

The importance of the care of the teeth in this institution is indicated by the statement of the Dental Department as contained in the Bulletin. Particularly is this statement interesting in view of the good work being done in the correction of malocclusion.

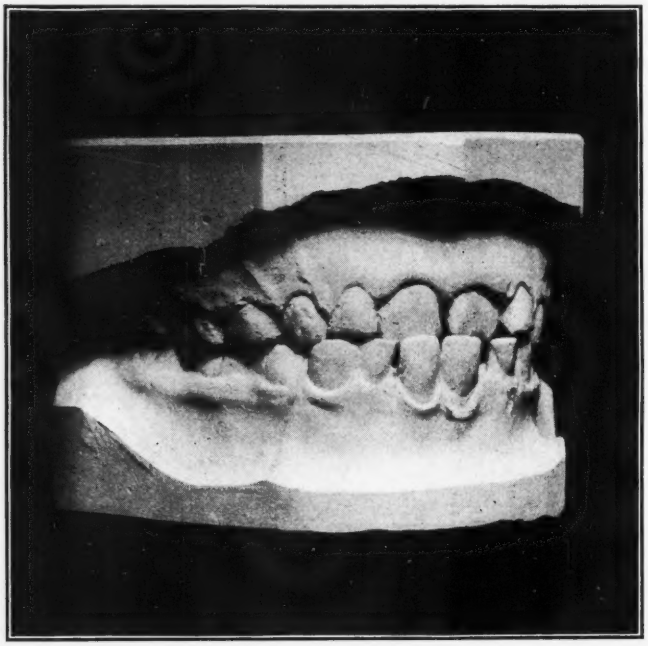
We understand that this department of Girard College is in charge of Dr. Samuel P. Cameron as dentist-in-chief, who deserves a great deal of credit for the results accomplished, which results have merited the attention of the Bureau of Education of the United States Government. In the report as set forth by Dr. Cameron, we find the following interesting facts:

Realizing the importance of the care of the teeth as a factor in the conservation of normal development and the health of the boys, and with the knowledge that a large percentage of disease and lack of mental and physical development are due to deleterious effects resulting from neglect and improper treatment of diseased conditions and malocclusion of the teeth, the board of directors of Girard College reorganized the department of dental surgery, which was formally opened on September 11, 1911. It is composed of three operating rooms, a waiting room, and a dental laboratory.

The whole equipment in this department was selected and installed with the greatest care. The fitting out of what is one of the most elaborate dental departments to be found in any institution or school of this kind in the world has for its sole object and aim the care of the boys in Girard College and the practice of dentistry for them as an exact science. An elaborate equipment of this character has been considered unnecessary in most institution and school work; in fact, the care of children's teeth, particularly the temporary teeth, has been, as a rule, neglected by both parent and dentist.

With the enormous task of caring for and establishing a healthy condition in the mouths of approximately 1,500 boys, the necessity for having every facility at hand for rapid, thorough, and careful work is quite obvious. The white marble partitions, white enameled steel cabinets with porcelain tops, white enameled chairs, engines, and switchboards were selected to create an impression of cleanliness and refinement which we desire the boys of Girard College to have of their dental department. On leaving college the boys will then seek to have their teeth cared for in an office where a carefully selected equipment is available and where a high standard is maintained. These are usually found in the offices of the most progressive men, who realize that in their adoption they are enabled to advance their work to its highest degree of perfection.

The dental department of Girard College is under the care of a dentist in chief, two assistant dentists, and a clerical and mechanical assistant, all four of whom give their full time to the care of the boys in the college. After a thorough examination has been made and the condition of the oral cavity recorded, some simple and painless operation is performed, such as cleaning



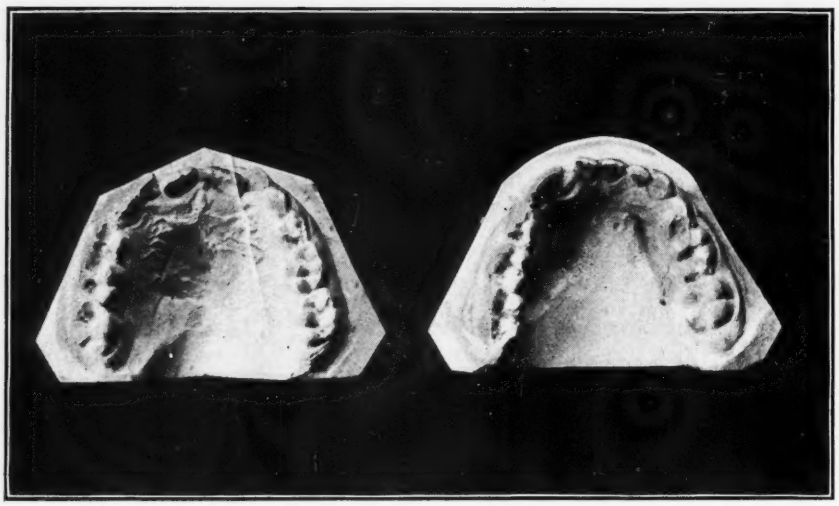


Fig. 1.—Case of 8-year-old boy before treatment. Upper central incisors erupting inside of the lower central incisors.

the teeth. In this way the boy's confidence and co-operation are gained, and he is interested in what is being done for his welfare. He is then given an appointment to return at a subsequent time, and his work is carried on and completed as rapidly as possible. His appointment is made for one hour and promptness is insisted upon. In this way he loses no more time from his school than is necessary.

A record card has been carefully prepared, so that every treatment and operation performed during each boy's attendance in the college can be kept on file and referred to at any time.

It is not deemed sufficient to treat the boys in Girard College for present diseased conditions only, but to study the oral cavity as a whole. By prophylactic methods a healthy and aseptic condition is established as nearly as

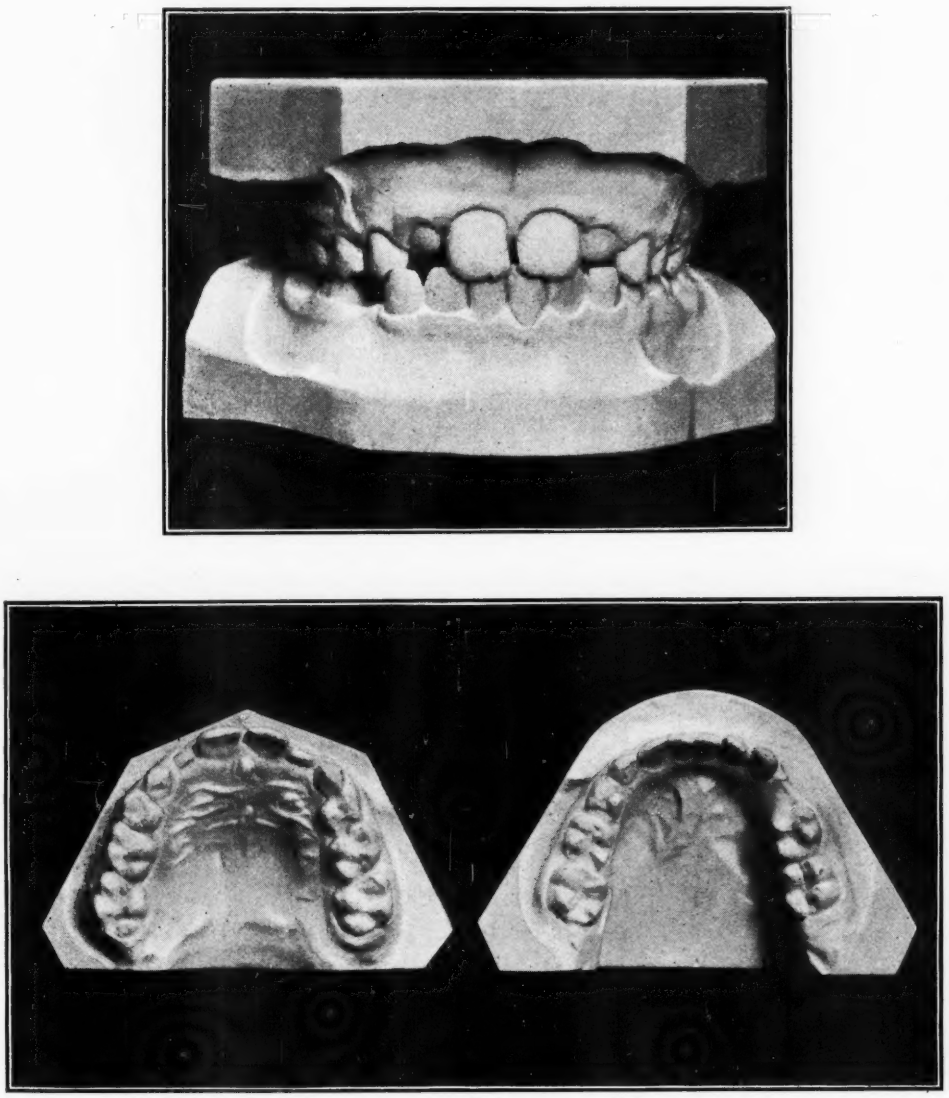


Fig. 2.—Case shown in Fig. 1. These casts were made after four weeks' treatment.

possible and the lost tissue is restored by means of fillings, etc. A study of each individual case is made as to its requirements. Malocclusion and irregularities of the teeth are studied by means of carefully taken plaster of Paris impressions, from which exact casts of the mouths are made. From these can be determined the lack of development and harmony of the alveolar process, the muscles, and surrounding tissues, which influence the growth of the jaws, going to make up a harmonious facial development.

The character of the work being done for our boys can perhaps be best shown by the accompanying photographs made from the plaster casts of some of the cases treated.

The first case (Figs. 1 and 2) is that of a boy 8 years of age. Fig. 1 shows the case before treatment, with the upper central incisors erupting

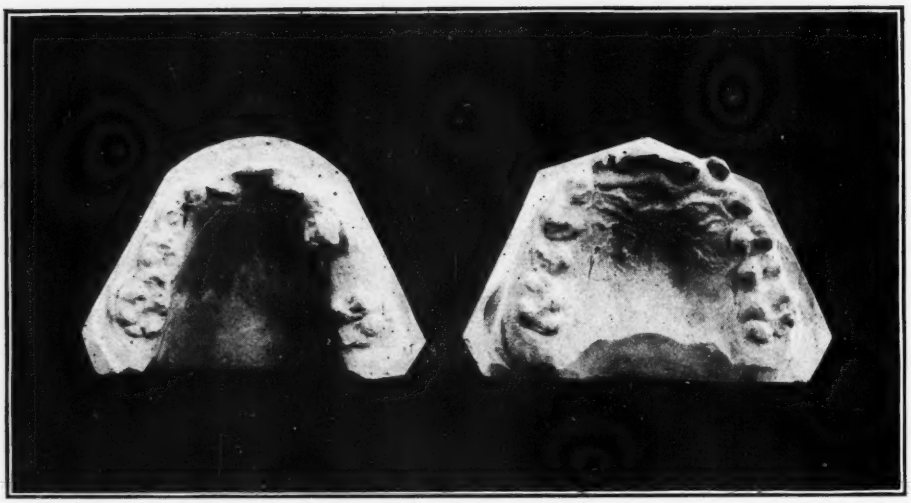


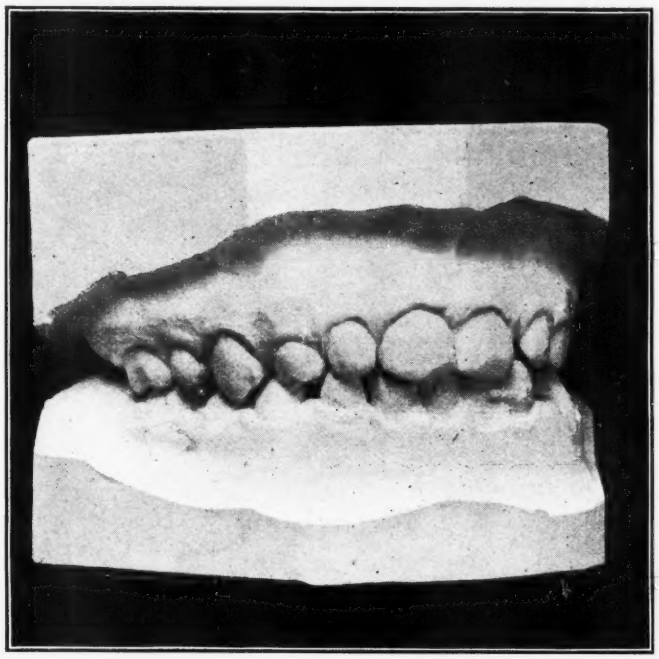
Fig. 3.—Casts of boy 10 years of age.

inside of the lower central incisors. Fig. 2 shows pictures of casts made from the mouth of the same boy after four weeks' treatment.

The second case (Figs. 3 and 4) is that of a boy 10 years of age. Fig. 3 shows the inside of the lower central incisors; the maldistribution of force in masticating of the superior centrals wedging between the lower central and lateral incisors had set up an irritation resulting in a deseased condition of

the gum and bone tissues. Fig. 4 shows photographs from casts made after two and one-half months' treatment. By establishing normal occlusal relations, the surrounding tissues returned to a healthy condition.

The third case (Figs. 5 and 6) is that of a boy 15 years of age. Fig. 5 shows all the teeth in both arches out of harmony. The boy's ability to



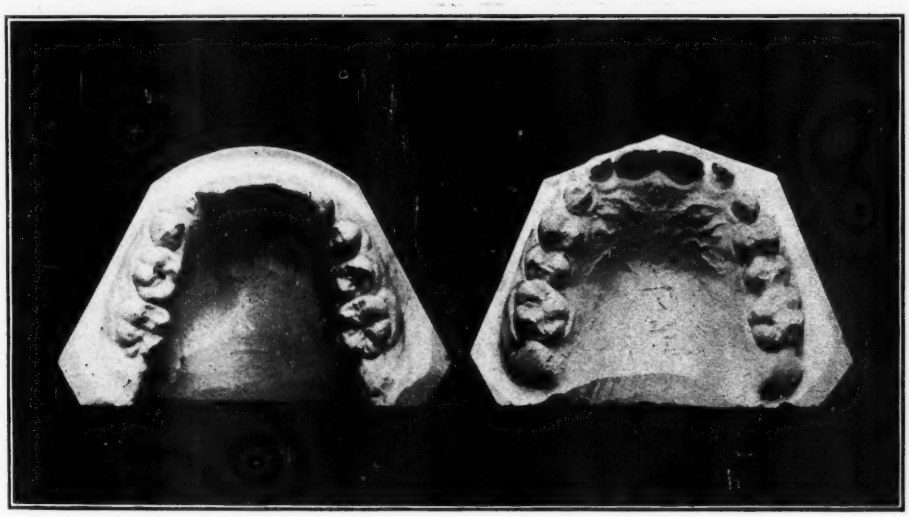
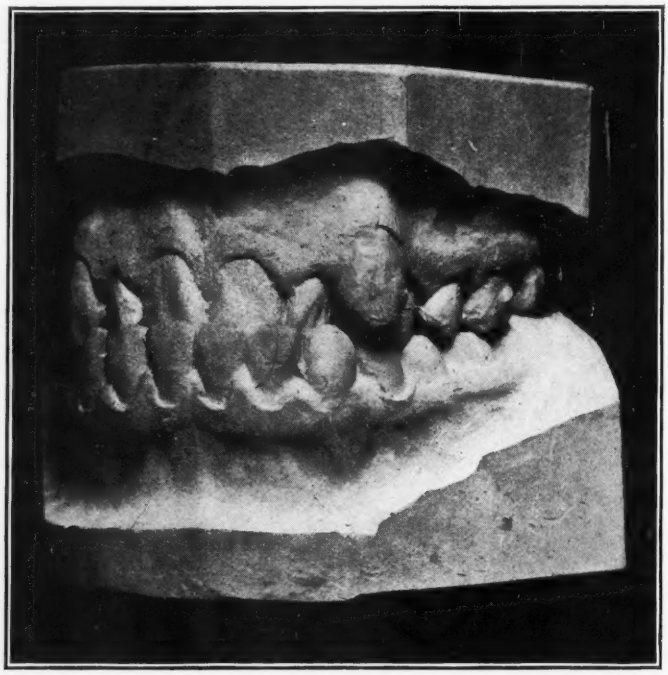


Fig. 4.—Case shown in Fig. 3 after 2½ months' treatment.

properly masticate his food is badly interfered with, and the lack of development of the superior maxillary bones and alveolar process has caused marked facial deformity, as well as interference with normal respiration. The crowded condition of the upper arch would clearly indicate that the temporary teeth had been neglected and perhaps prematurely lost and the early

eruption of the permanent teeth had gone on unassisted. A few weeks' treatment at an early age, similar to that in the preceding cases, would probably have resulted in normal development. Fig. 6 shows photographs from casts made of the same case after treatment. All of the teeth in both



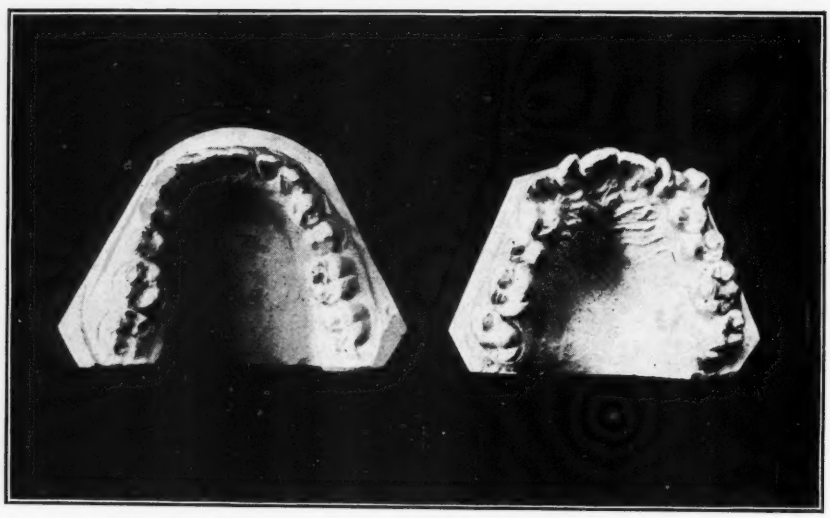
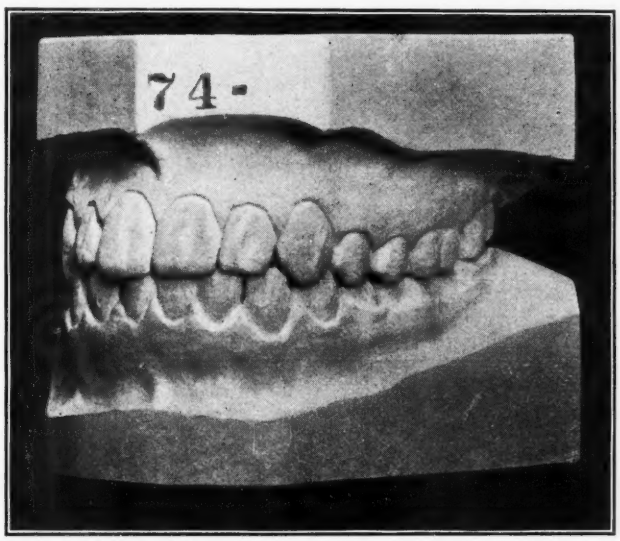


Fig. 5.—Case of boy 15 years old. Teeth in both arches out of harmony.

the upper and lower arches were widened and straightened; normal occlusal relations of the teeth were established; the growth of the alveolar process and maxillary bones was stimulated, and the normal function restored to all the surrounding tissues. Nine months' time was necessary for the active treatment of this case, and it will have to be kept under observation for

perhaps one year longer before the bones will have assumed their full normal development and a permanent result assured.

The fourth case (Figs. 7 and 8) is that of a boy 13 years of age. Fig. 7 shows the lack of growth of the maxillary bones and alveolar process, due to premature loss of the temporary teeth. The bite is closed, causing the lower central incisors to bite into the soft tissues in the roof of the mouth. Note the loss of space for the lower second right bicuspid, and that the superior



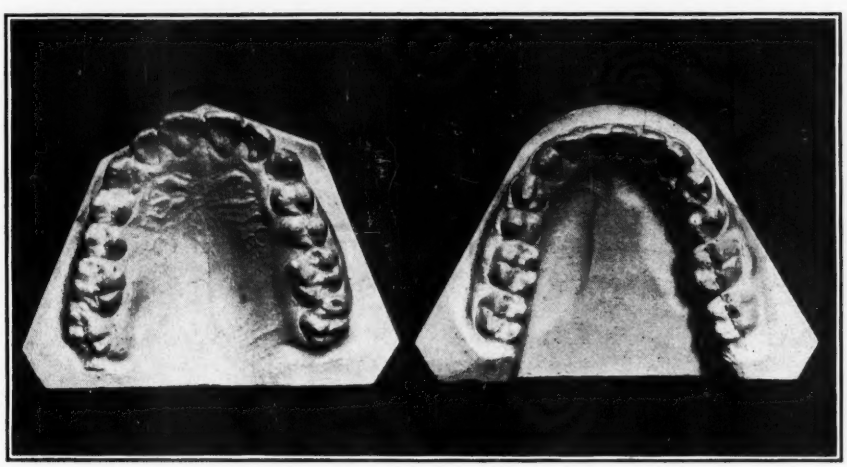


Fig. 6.—Case shown in Fig. 5 after treatment.

left bicuspid is erupting inside of the arch. The narrow and crowded condition of both arches interferes with the normal functions of mastication and respiration. Fig. 8 shows pictures of the same case after treatment. The arches are broadened and lengthened to accommodate all of the teeth. It required about nine months to produce this result, which could have been obtained in about as many weeks if taken at an early age, when a perfect result would have been assured by assisting nature a little. Too much emphasis cannot be placed upon the necessity of early dental attention, and

particularly the care of the temporary teeth. When they are lost prematurely, the permanent teeth erupt unassisted into various conditions of irregularity and malocclusion, which greatly interfere with the growth of the bones of the head. Interference with the organs of respiration results in a lack of normal development of the tissues of the body, following the improper oxygenation of the blood.

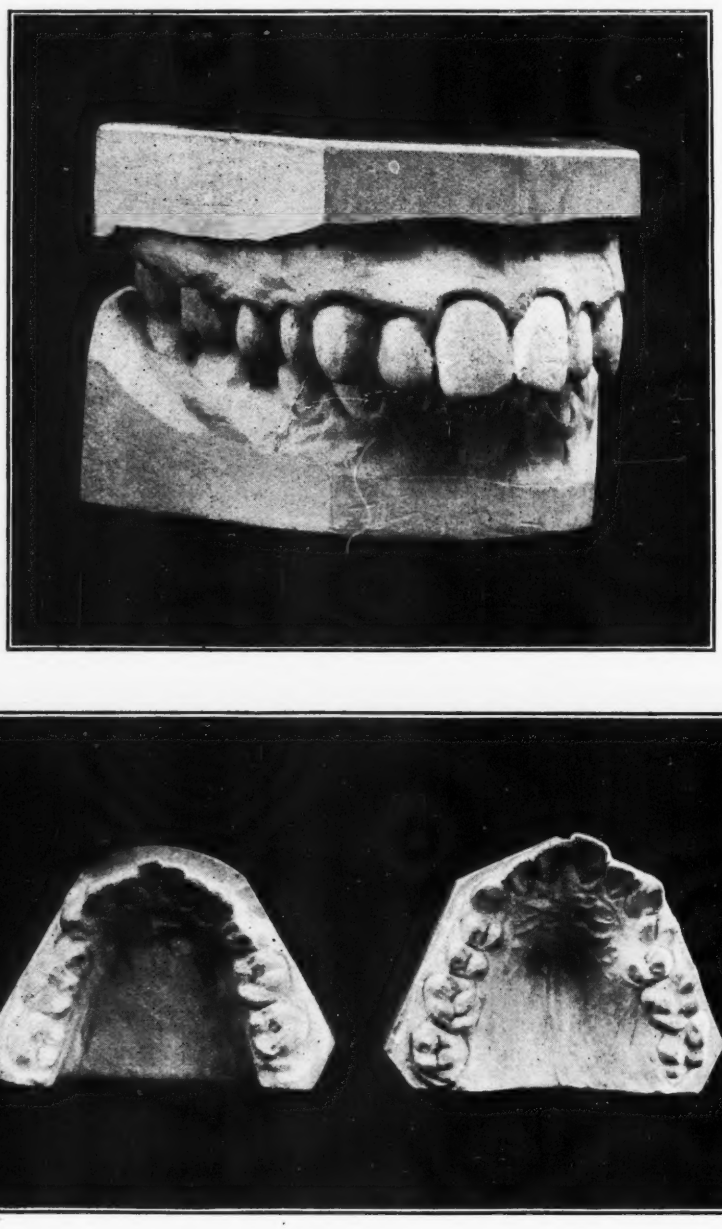
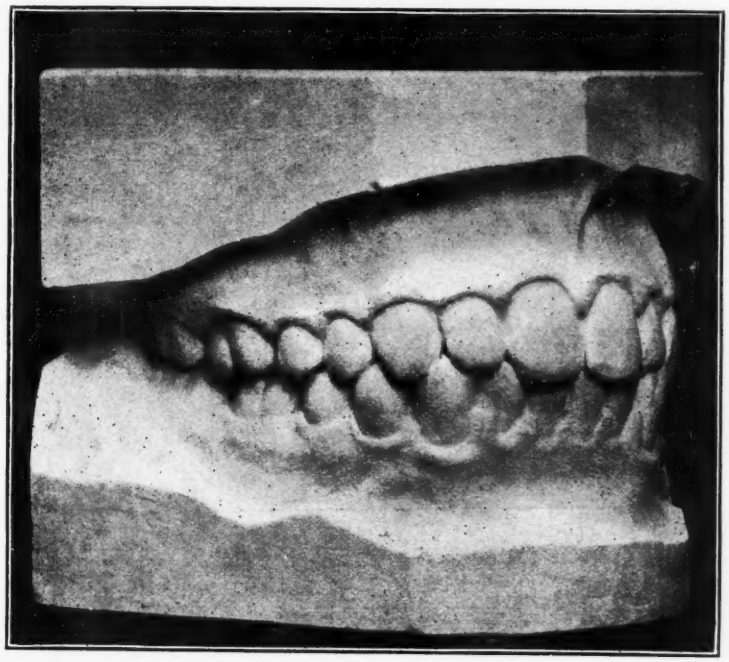


Fig. 7.—Case of boy 13 years of age. Lack of growth of the maxillary bones.

In the examination and treatment of approximately 42,000 teeth we found it necessary to extract 42 permanent teeth, or a loss of one-tenth of 1 per cent. This is a very low percentage of loss; thus, of 122 boys who entered the college in September, 1913, only 8 had received previous dental attention and 6 boys under 9 years of age had some of their first permanent molars in

such a diseased condition that the surrounding tissues had become infected, due to the death of the dental pulp, the formative element of the tooth, before the roots of the teeth were fully developed.

A great many boys come into the department in a sadly neglected condition. Fig. 9 shows photographs of casts of the mouth of a boy 8 years of



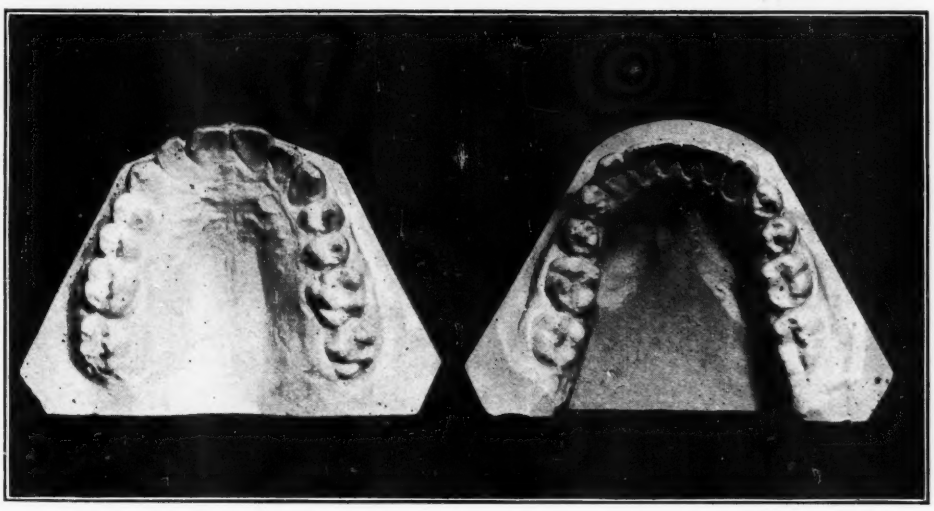
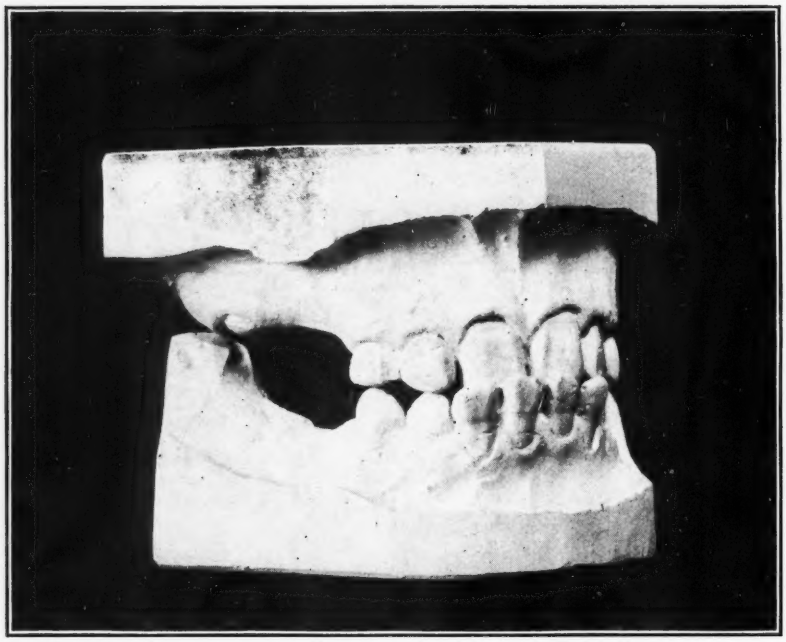


Fig. 8.—Case shown in Fig. 7 after treatment. Arches have been broadened and lengthened to accommodate all of the teeth.

age. Five temporary molars and one permanent molar have been prematurely extracted, and two permanent molars are badly decayed. This might properly be described as criminal negligence, since it will perhaps be four or five years before the permanent teeth will erupt to supply the child with any means with which to masticate his food. One can readily appreciate how this poor boy's physical development will be hindered.



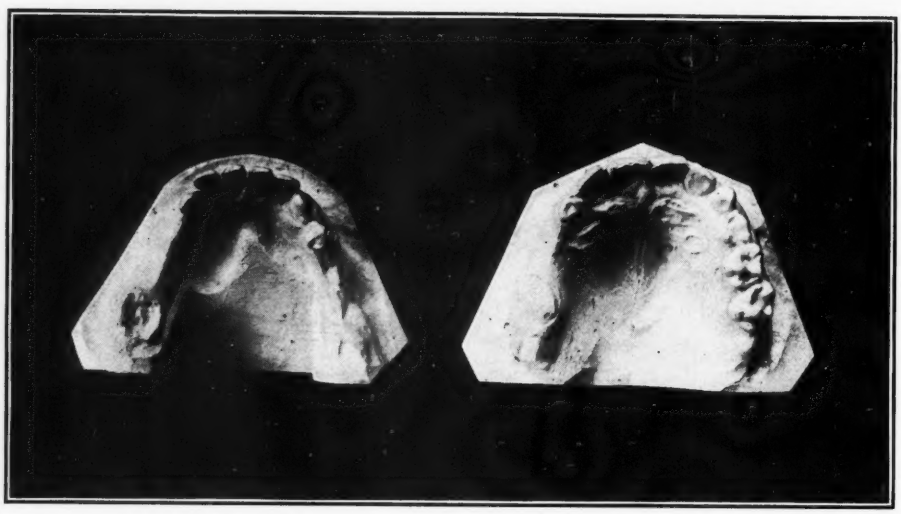


Fig. 9.—"Criminal Negligence" in the case of a boy 8 years of age. Five temporary molars and one permanent molar have been prematurely extracted, and two permanent molars are badly decayed. It will perhaps be four or five years before the permanent teeth will erupt to supply the child with any means of masticating his food.

Following is the number of operations performed in the dental department of Girard College during a period of 15 months:

Amalgam fillings	1,843
Phosphate of zinc fillings	3,480
Gutta-percha fillings	1,149
Teeth devitalized	228
Putrescent teeth and abscesses treated	250
Root canals filled	857
Crowns and bridges inserted	10
Permanent teeth extracted	42
Permanent teeth replanted	1
Number of cases of malocclusion under treatment	74

Certain conclusions seem warranted from the experience of Girard College in the care of the health of boys. Although the wards of the institution come with what is, on the whole, a bad family history, the death rate is low and the general condition of health favorable. By good sanitary conditions in the college and protection of the water and milk supply, typhoid and other serious illness have been largely eliminated. Medical inspection and the correction of minor defects of the nose, throat, ear, eye, and other organs have contributed to the general good health of the pupils of the college, and the department of instruction in the institution reports that this care has markedly increased the school efficiency and materially reduced the problems of discipline. Perhaps the most evident good result has come from the new dental department. The present plan of caring for the teeth was introduced in September, 1911, and the improved condition in the health of the boys and in their personal appearance has been most marked since that date. The Board of Directors of City Trusts, which is officially responsible for the management of the college, and members of the staff which is carrying out their policies, unite in testifying to the notable service which a correct physical basis has given for the work of Girard College in rearing and educating its boys.

The Medical Aspects of the Second Dentition.

It has been wisely pointed out in a recent paper, that interest in the second dentition should not be confined to the dental surgeon alone, but shared by the medical profession in general. Dr. Hubert Armstrong, writing in the *Liverpool Medical Chronicle*, reminds us that calcification begins in the case of the first permanent molar during the twenty-fifth week of embryonic life, that the final eruption of the "wisdom-tooth" does not take place until early adulthood, and that a sound dentition is one of the essentials to good health. It has been noticed that one of the most prevalent dental defects among young people is caries or alveolar abscess of the first molar which appears at the sixth or seventh year. As this tooth does not displace one of the previous set, parents often make the mistake of supposing that it belongs to that set, and allow it to share in the neglect which their temporary character too often brings upon them.

Many of the influences which cause delay or defect of the first dentition, operate also in the second. Thus rickets, although usually outgrown by the time of the second dentition, may delay it or by the overgrowth of the jaw characteristic of the disease may occasion malposition of the teeth, and entire absence of one or two from this same cause is not unrecorded. Cretinism may also retard the advent of the second teeth to a marked degree.

As to the influence of syphilis, Dr. Armstrong has been unable to establish to his satisfaction that the accelerating influence noticed in the first dentition is continued through the second. The so-called Hutchinson's teeth, the upper central incisors with the crescentic hollowing of the edges, he has found in about fifty per cent of syphilitic children under his observation. He calls attention to the fact that this deformity may be caused by other diseases than syphilis, and that so great an authority as Hencoh attri-

butes it to rickets instead. Dr. Armstrong brings forward an argument, which ought not to be needed, against the practice once so frequently resorted to, of exposing young children to infection of the exanthemata in order to have them "get it over." These early attacks may cause the germs of the teeth to suffer such nutritional changes as to lead to their destruction and the consequent absence of the corresponding tooth. At a later period acute illness does not apparently inhibit the eruption of the teeth. Deformities of the teeth result from the thumb and finger sucking, and the milk teeth should be cared for not only in their own interests but in that of their successors, since alveolar abscesses in connection with the deciduous teeth interfere with the follicle, and if the first teeth are extracted too early the first molar travels forward and leaves no room for the second bicuspid.

The second dentition should normally be accomplished with few if any symptoms beyond the loosening and dropping out of the first teeth. When the remnants of these are incompletely attached, they become a source of trouble and sometimes of serious ill health. They furnish a lodgment for particles of food, and cut into the cheek, promoting the formation of septic ulcers. The effect upon digestion and health of the presence of such poisonous matter in the mouth is easily imagined, and necessitates the overcoming with promptness of that reluctance of having a tooth pulled which seems inherent in human nature.

EXCERPTS

Tungsten and Molybdenum Experiments for Use in Orthodontia Appliances.—In Research Report No. 7, being a report of Further Studies from the Scientific Foundation and Research Commission of the National Dental Association, a paper on "Some Practical Uses in Dental Practise for Tungsten and Molybdenum is presented by Weston A. Price, D.D.S., M.S., and Frank A. Fahrenwald, E.M., M.S. Some excerpts from this report, which appeared in the March issue of the *Journal of the National Dental Association*, of especial interest to orthodontists, are given in the following paragraphs:

Tungsten, with its elastic content about twice that of steel, its melting point nearly twice that of platinum, its stiffness about six times that of 30% iridium in platinum, and with the remarkable property that it does not anneal or lose its stiffness and elasticity even when heated to the melting point of gold, makes it particularly adaptable for many parts of orthodontia appliances. We shall not presume to advise what principle of application of force shall be adopted or what particular design of appliance will best secure its application, but will suggest how we may adapt ourselves to some of the properties of these new metals and, in part, to what extent we may adapt them to our needs. After testing tungsten in practical use in expansion arches for about a year, and after extreme laboratory tests, we believe it to be superior for various forms of expansion arch to any metal that we have heretofore found for the following reasons. The required elasticity and regidity can be secured with smaller sizes. Attachments of any kind may be made to it with pure gold or with any karat of gold solder, without changing its stiffness at the point of attachment. The entire appliance and its connecting parts can be of such noble metals that not only is there practically no discoloration or oxidation of the appliance, but also with very slight electrolytic potential difference between the various parts, thereby reducing the electrolysis. A tungsten bow arch of .030 inch diameter, or approximately 21 gauge, will have ample elasticity and rigidity for expansion arches for practically all children, with a efficiency equal to a gold clasp metal, iridio-platinum or German silver bow arch of much larger size. When the threaded sections are used, they will be gold soldered to the bow or telescope, its squared ends as in the later forms of Angle appliance.

This great elasticity of tungsten makes it particularly desirable and adaptable for the new type of adaptation expansion arches, which are bent to conform accurately to the irregularities of the teeth, and to which are attached fingers or pins, which enter into tubes on the teeth and thereby move them at will. A much smaller size of tungsten can be used for this purpose than may be in the other metals and still have a large factor of stiffness for expanding the arch. The pins can be attached with any gold solder without danger of softening or annealing the arch and the bends can later be taken out cold, if not sharp, and if sharp by heating to a dull red while bending. We believe that with this metal, with its very high factor of strength and elasticity, the orthodontic appliances of the future will be modified to place more of the appliance out of sight, with slender arms attached, passing over the proximal contact points to their points of attachment, producing practically the same effect mechanically that is obtained at present, but with much more sightly appliances. Where the pins on the adaptation arch require elasticity the small sizes of tungsten are particularly suitable.

The tungsten will prove particularly advantageous for anchorage retainers of all kinds, after orthodontic movement, for the following reasons. Its very large factor of strength makes it possible to use smaller sizes and therewith secure even greater rigidity. It does not crystalize and break like gold clasp bar, and similar metals, under the strain of mastication, which force produces a slight spring or bend continually. All orthodontists are familiar with this embarrassment.

Tungsten is also particularly well adapted for all sorts of auxiliaries such as fingers, springs, supports and alignment arms, all

of which may be attached with any of the gold solders, and their factors of strength is so large that they withstand the strain much better than ordinary metals. The tungsten is particularly well adapted for certain parts of removable orthodontic appliances, in which case it has several distinctive advantages, among which are the folllowing:

Relatively less bulk for the same strength.

High elasticity for clasping over teeth.

Great strength for clamping parts; soldering with pure gold or any gold solders.

Easily cleansed.

We believe this type of orthodontic appliance will greatly increase in favor because of the particularly adaptable qualities of the tungsten and molybdenum. Tungsten is also well adapted for retainers for various forms of orthodontic plates, as well as for retainers of all other kinds of plates. While tungsten has some very distinctively desirable qualities, it has some others to which we are compelled to adapt ourselves. Gold and gold solders do not readily flow on tungsten and molybdenum in an ordinary oxidizing atmosphere (see closing sentence), because while these metals resist oxidation at ordinary temperatures, they oxidize readily at high temperatures, when exposed to oxygen or an oxidizing atmosphere. We expect to find a flux that will enable us to flow these metals directly onto tungsten and molybdenum. Accordingly, the material, as it will be provided for dental uses, will be already alloyed on its surface with gold or gold and palladium, which metals unite perfectly with it under a proper atmosphere, and all soldering that is done upon these metals later seems as firmly attached as if it were done on iridio-platinum. The addition of seven per cent of palladium to gold raises its melting point in the neighborhood of 200 degrees C. which surface will receive solders made of gold and platinum or any gold solders or pure gold. These coatings of gold or gold and palladium have so nearly the electrolytic potential of 22K or high gold solders with which the parts would be attached that electrolysis is reduced to a minimum, and the entire completed appliance has the appearance of being constructed of gold or of gold and platinum, if the palladium covering is used. Both tungsten and molybdenum have very low coefficients of expansion as compared with all the metals we have been using in dental practise. This point is of particular advantage in casting work, of which we shall speak later.

At this point we will review some of the characteristic features of both tungsten and molybdenum. Tungsten has a hardness so great (so we are informed by the General Electric Co.) that a specially prepared phonographic needle point made from it will out-wear two hundred hardened steel points; will draw into a finer wire than any known metal, has a tensile strength thirty times that of gold and ten times that of iron; is not affected by ordinary acids or alkalies, except hydrogen dioxide in which it is soluble. Its melting point if over 3000 degrees C. or 5400 degrees F. It is from six to seven times as stiff as iridio-platinum of 30% iridium.

Molybdenum has a melting point a little lower than tungsten, namely, 2500 decgees C. (*Note.*—Gold is 1063 degrees C. and platinum 1755 degrees C.) and it has a tensile strength five and one-half times that of iron. Molybdenum has many properties similar to tungsten, its chief difference being its lack of elasticity, which makes it particularly desirable for those forms of orthodontic appliances where we require a very tough slightly elastic piece. When hard drawn it is not annealed at temperatures up to the melting point of gold and its elastic content is a little greater than annealed gold clasp metal. When once annealed at high temperatures it does not recover its elasticity originally put in by hard drawing but has enough elasticity for certain uses in orthodontia work, where this quality is wanted in low degrees. It has a very great toughness and rigidity, making it particularly desirable for all those uses where the material requires to have great strength and rigidity with a small mass but capable of withstanding excessive bending.

This metal, like the tungsten, will be furnished with gold or gold and palladium coating, the latter having the color of platinum. The following table gives the sizes of tungsten and molybdenum that are at present being drawn. (Other sizes will be added as required.) The approximate B. & S. gauges, weight per foot in grams and price per foot, etc. The cost of molybdenum is about two-thirds that of tungsten.

The present price for gold, or gold and palladium coated tungsten is about one-

fifth that of platinum or one-sixth that of iridio-platinum. The present price of molybdenum, gold or gold and palladium coated, is about one-eighth that of platinum or one-ninth that of iridio-platinum. Since the strength of tungsten is approximately six to seven times that of iridio-platinum, we can reduce the size to about one-half by weight and still have a larger factor of safety. This reduces the relative cost of coated tungsten to about one-twelfth that of iridio-platinum for a given case. There is the additional great advantage of conserving more of the root material with greatly added strength in proportion. This applies also to the porcelain. We fully expect that these prices will be greatly reduced in a short time, in fact a poorer quality can be purchased at present for about one-half the above prices. It is not possible as yet, however, to secure anywhere in the large sizes as choice a quality as we quite certainly will be able to get in the near future, for the expense for large diamond dies and the skill required for drawing constitute the chief expense for the material, as well as the chief drawback to producing soon the quality in the large sizes that is now available in the smaller sizes.

Diameter in thousandths of of an inch.	*Approximate Gauge B. & S.*	*Wt. per ft. in grams.*	PRICE PER FOOT. *Bare Wire*		*Gold Coated*		*Gold and Palladium Coated*	
			Mo.	*W.*	*Mo.*	*W.*	*Mo.*	*W.*
.010	31	.30	$ .21	$ .31	$ .40	$ .50	$ .41	$ .51
.015	27	.8	.27	.48	.50	.70	.52	.72
.017	26	.....	.36	.60	.60	.83	.62	.85
.020	25	1.2	.45	.77	.70	1.02	.72	1.04
.022	24	.....	.53	.93	.78	1.18	.80	1.20
.025	23	2.0	.64	1.14	.90	1.40	.93	1.43
.027	22	.....	.71	1.29	.97	1.55	1.00	1.58
.030	21	2.8	.83	1.48	1.10	1.75	1.13	1.78
.035	20	.....	1.04	1.89	1.30	2.15	1.34	2.19
.040	19	4.8	1.22	2.22	1.50	2.50	1.54	2.54
.045	18	.....	1.42	2.58	1.70	2.86	1.74	2.90
.050	17	7.6	1.60	2.85	1.90	3.15	1.95	3.20

On account of its great hardness and strength, tungsten is destined to be of very great use in dental practice for the wearing parts of removable bridge work. When we realize that it is almost impossible to get a file hard enough to cut it without ruining the file, and also that when a tungsten phonographic needle point will outwear two hundred hardened steel points, we get a conception of its great superiority over the soft gold and platinum alloys, that we are using at present for wearing parts. We have used it for about a year in such places as the bar for Gillmore attachments and the wear has scarcely polished it. In fact, we cannot detect the slightest wear at this time, in such situations as we have formerly used gold and platinum alloys, which show the excessive wear in a few months and many bars have had to be replaced on account of this wear. It is as easily adapted as are the ordinary metals. On account of its superior strength, it will be possible to make removable attachments of much less bulk than have been necessary with gold and platinum compounds. The neck and ball for a Roach attachment, for example, may be very much smaller and have the same or a larger factor of safety of strength, besides the great superiority in wearing quality. The tungsten round wire can be ground to one-half its thickness and two pieces placed together for a split pin attachment, with the corresponding great advantages of strength and wear. The superior strength is of great value in making anchorages to vital teeth, for small posts can be put in laterally to the pulp and still have sufficient strength to carry their load.

The tungsten is also very valuable and advantageous for the connecting bars between saddles, used as removable bridges and plates. For irregular shapes several small pieces of coated tungsten may be laid together in a bundle or side and side and any karat of gold solder flowed over them, producing a rigidity manyfold that we have been able to procure with any ordinary gold and platinum compounds. It is particularly advantageous for the lingual bar of lower bar plates, which may be relatively much smaller and have still a larger factor of strength.

There are few places that tungsten will be appreciated more often than for posts

for crowns, where we need a very large factor, of strength with a small cross-section; it being six to seven times stiffer than iridio-platinum. The tungsten may be used in much smaller diameters and still have a much larger factor of safety. This not only permits us to preserve the tooth structure for its much needed strength, but also permits of a much smaller hole in the porcelain crown, which would be appreciated by our practising dentists, since we have been required to use crowns for small teeth, which had the strength greatly reduced because of the needed large hole for the ordinary large size post material. The gold base for a porcelain crown will be made by building the wax pattern base about the post, underneath the porcelain crown and proceeding in the usual way to cast directly on to the post. The hot gold compounds unite with the alloyed surfaces of the tungsten, making a perfect union between that is very strong. While the coefficient of expansion and contraction of tungsten and molybdenum are much lower than that of porcelain, making it unadvisable to fuse porcelain directly around them, as is done over platinum, these metals probably will have an important place for pins for porcelain teeth, because of their much greater strength. This may be done by putting a metal over the outside of the tungsten or molybdenum, which has a relatively high coefficient of expansion and will, thereby, correct for the too low coefficient of these metals alone. This is done in part at present, by putting a platinum coating over an iron and nickel compound, also by soldering a non-platinum pin into a platinum tube, which has been baked into the porcelain. On account of their much greater tensile strength, not only may you use smaller sizes of pins, but it is not improbable that a removable pin bridge tooth will be constructed, using these metals.

Both tungsten and molybdenum are of great advantage to prevent the distortion of M. O. D. of horse-shoe-shaped inlays. The method of using, is to either bend suitably a piece of tungsten or molybdenum or use a straight piece and imbed it into the wax pattern in the cavity. The wax pattern is thereby prevented from warping or shortening across the occlusal dimensions by the rigidity of the tungsten or molybdenum. The pattern is invested in the usual way as though the metal support was not within the wax. It cannot get far out of position, when the wax melts from around it and the gold is cast about it without a special consideration for the metal bar. As the gold contracts about it, it is prevented from behaving according to its normal law of contraction, and it does not shorten across the occlusal as it otherwise would. The coefficient of contraction and expansion of these metals is so much lower than that of gold, which latter increases its rate as it approaches its melting point, that the total dimension change of tungsten between room temperature and the temperature of molten gold is about 1/4 that of gold and its ordinary alloy compounds, for that same range, while the change with molybdenum for that temperature range is only about 1/6 that of gold and its compounds. The judicious use of these metals under these conditions make it possible to make difficult cast restorations which will go into place with much greater freedom and accuracy than when they are not used, unless a very careful technic is used to introduce an error in the dimensions of the wax after releasing its elasticity sufficient to compensate for the contracting gold.

Another important use for these two metals is for special broaches for treating root canals, particularly for the sulphuric acid treatment. Molybdenum, on account of its being softer follows the canals more readily than tungsten, and being exceptionall tough, is in little danger of being broken. Neither are affected by the acids that would be used in the tooth. On account of its being brittle, however, tungsten requires to be used with greater care and judgment than molybdenum when used for broaches. It is difficult to cut barbs on the tungsten, though they can be cut readily in the molybdenum.

Tungsten is particularly well adapted for instruments for mixing and handling cements, because of its resisting action to practically all acids.

Tungsten has relatively very high thermo conductivity. This fact, together with that of its non-oxidizing qualities are ordinary temperatures, makes it superior to platinum and platinum iridium for all forms of make and break contacts for electrical appliances, in fact it has already largely supplanted platinum for this purpose.

Palladium may be purchased by anyone

directly or through his dealer from the American Platinum Works, Newark, New Jersey, or from any other dealer in noble metals. The cost at the above named place will be approximately $48.00 per ounce for 1/2 ounce or less, or $46.00 an ounce for larger quantities. Please note that this is equivalent to buying platinum at about $26.00 an ounce since the bulk of palladium is nearly double that of platinum per ounce.

As this goes to press we are greatly encouraged that a satisfactory flux will be developed for tungsten and molybdenum. We can now gold solder tungsten with the aid of a special flux. It is not entirely satisfactory as yet, however.

Angle's New Appliances: Some Points in Construction.—Dr. Sheldon Friel, of Dublin, Ireland, in the January, 1915, issue of the *Dental Record* (London), points out a few methods that can be employed in the constuction of Angle's new appliances which reduces the cost without interfering with their efficiency. He says, in part:

Angle's new appliance is a thin wire arch bent accurately around the labial surfaces of the teeth and attached to them by vertical pins soldered to the wire, which engages into tubes soldered on plain bands on each irregular tooth. The movement of the teeth is accomplished by removing the wire arch and straightening the irregularities of the curve a little. The arch is then forced back into the tubes and the teeth have to accommodate themselves to the new shape of the wire arch. This process is repeated at every visit.

The chief difference that will be noticed is in the clamp bands, the attachment of the arch to the clamp bands, which is a slight modification of Young's attachment, and in the arch pins. The clamp bands in the first case are Angle's gold alloy with non-rotating tubes, and in the second case a nickel silver all-closing non-corrosive form.

The next alteration is in the attachment of the arch to the clamp bands. I have found that in cases where teeth have to be moved individually or in groups, Young's attachment is more efficient, the power or force being gained by the spring of the arch wire. In cases of Class II (Angle) where the lower teeth are regular, I find that Angle's end section attachment on the lower teeth is better. The tubes on the clamp bands give a more comfortable hold for the intermaxillary elastics.

In the first case I have fitted Angle's end sections and the force to bring the four incisors forward is obtained by the tightening of the nut on the end sections, and by bending the arch wire.

In the second case Young's attachment is used. The force to bring the teeth forward is obtained by increasing the length of the arch by opening the loop just in front of the clamp bands, instead of the screw as in the first case. The lock in Young's attachment on the clamp band is made by bending the end of the arch over the vertical tube. It is difficult to open the wire, it is so stiff. I have slightly modified it. The lock piece of wire is thinner than the arch wire to give more spring.

The third alteration is in the arch pins. These arch pins, as shown in the first case, are most beautifully made. The ends are beveled on two sides, and also the edge crescent-shaped. This shaping is to fit into the file scratch on the arch when soldering. The head is also shaped to clip over end of tubes and keep it in place.

In the second case the pins are made out of Angle's thinnest gold platinum retaining wire. The beveling is obtained by cutting the wire sharply across with an ordinary pair of cutting pliers. This leaves a very slight bevel, and in the center where it has not cut quite through, a sharp, exceedingly fine ridge, which engages into the file scratch on the arch. When soldered in place the required amount is cut off and a catch filed near the end.

I have found that these slight alterations work well and considerably reduce the cost.

Discussion.

Mr. Highton asked whether any difficulty had been found in applying the device, because he noticed that the teeth did not seem to be actually parallel. He also asked whether Mr. Friel had had any experience of a finished case so as to see whether the result was much better than that with the ordinary arch and bands.

Mr. Harold Chapman said he had seen several cases with the appliance in position and had been struck by the great thinness of the buccal wire, and had wondered whether it was powerful enough to give expansion in the molar and bicuspid region, especially in patients of about

fourteen years of age. He highly appreciated Mr. Friel's enthusiasm in coming from Ireland to make this communication.

Mr. Friel, in reply, said there was difficulty in fitting the appliance to the model, but no great difficulty in applying it to the actual teeth, as there was considerable give in the peridental membrane. In the first model he had shown, one of the lateral incisors was broken across the base in trying to get the arch wire on. The appliances were made in the mouth and then plaster impressions were taken, and the bands placed in the impression and the model cast. The arch wire was put on later. With regard to results, he had only been using the appliances for a year and so far he had had excellent results. In cases where the canines were completely outlocked and the spaces were closed, he had opened the spaces and got the canines in. The great advantage was that the roots were moved. In the first case he had shown if an endeavor had been made to move the teeth with an ordinary arch the upper incisors would have been tilted forward without the roots being brought forward, and it was the roots that required to be brought forward. One great advantage of the appliances was that it was only necessary to see the case once a month to tighten the bar, unless anything broke. The wire was quite strong enough to move bicuspids or molars; he had moved bicuspids buccally with the thinnest retaining wire, no thicker than pin wire. Success depended on having a constant spring.

The Mechanics of Some of the Bones of the Face.—In discussing the mechanics of the bones of the face, Sir Arbuthnot Lane, Bart., F.R.C.S., in *Dental Record* (London), of January, 1915, says:

Perhaps the most fundamental law I know is that "the skeleton represents the crystallization of lines of force. When force is exerted in the same direction it is laid down as compact tissue, when in various directions as cancellous tissue." The same principle applies also to the several soft parts of the body, but its application in this case is not so obvious or as easily demonstrated as it is in the skeleton.

Besides this, there are three very important laws in evolution.

1. That pressure produces change, altering the structure of bones, destroying soft parts, ankylosing adjacent bones, limiting or increasing the range of movement in certain joints, converting hyaline cartilage into bone, making new joints, etc.

2. That strain produces change, altering the form of bones by classification in the line of strain. It also produces definite changes in the soft parts.

3. That, when it is advantageous to the organism, an old mechanism may be altered or an entirely new one evolved without any obvious evidence of abnormal pressure or strain. As examples of 1 and 2 I would point out the changes in the form of the jaws and of the temporo-maxillary articulation in the various stages of dentition and in the edentulous jaw.

Another law which bears indirectly on these is "that the brain exerts a prior claim on the bone-forming centre at the cost of the rest of the skeleton."

If you study the anatomy of the laborer or of the individual who is the subject of a resting deformity, you find that it is perfectly different from the normal, and that "their skeletons represent first the fixation and later the exaggeration of the tendencies to change which are present when the attitude of activity on the laborer or that of rest in the feeble subject is assumed on a single occasion." Indeed, in any instances the anatomy has been so altered from the normal during what is only a portion of the lifetime of the individual that the variation exceeds considerably that between the human being and the higher age. In other words, it illustrates evolution during a short period of years. We all know how long it takes for tendencies to change to appear as actualities when transmitted to the offspring in what is called evolution. This transmission of a tendency to change is very well illustrated by the asymmetry of the rites and sternal pleurostea in the higher apes and by its occasional existence in the human subject, where it forms a retrocession to an ancestral type; also by the association of the last lumbar vertebra with the sacrum and the dissociation of the first sacral vertebra in the quadrumana as they gradually assume the more or less erect posture. Both these changes are observed occasionally in man as retrocessions to ancestral types. All these are the result of the transmission of tendencies to change which only appear as

actualities in the offspring spread over an immense number of years.

While the period of time required for the transmission of a tendency is usually very long, it would appear that certain acquired conditions can be transmitted with great rapidity. I refer to those which affect the bones of the face. Take for example the rapid change that takes place in the face of the offspring of the more vigorous country race when subjected to the debilitating influences of town life. Here objection may be taken to this being the result of the transmission of a tendency to change, since it might be asserted that the modification in form is acquired entirely after birth. On the other hand, the appearance of a defect in the lip or palate for the first time in a family is liable to be followed by its development in the offspring through any subsequent generations. I believe that these deficiencies of the lip and of the roof of the mouth are particularly liable to appear in the offspring of parents in the development of whose naso-pharynx the mechanical factor chiefly responsible for its development was absent.

If we consider the mechanics of the bones of the face the factors determining their form in obedience to the laws already referred to are very simple.

The function of the orbit is to accommodate the eye. The excision of this organ early in life removes the influence of the mechanical factor resonsible for its perfect development. In consequence the orbit ceases to develop in proportion to its fellow. The same applies to such soft structures as the lids.

The size of the nasal cavities and of the sinuses which communicate with them depends upon the pressure which is exerted by the air as it passes through them. If the free passage of air is obstructed by the presence of infected adenomatous matter in the upper part of the naso-pharynx the development of the nasal and communicating cavities is in abeyance. The degree of imperfection of their development varies with the extent of the obstruction and with the youth of the individual. I need not call your attention to the very characteristic changes which ensue when the mechanical factor which is chiefly responsible for the development of the nasal and associated cavities and of the bones which surround them is put out of commission.

This condition of imperfect development is also well observed in cases of defects in the roof of the mouth of sufficient size to prevent the forcible passage of air through the nose. The greater the deficiency of the palate the less is the pressure exerted by the air on the walls of the nasal cavities, and their development is in abeyance in a proportionate degree.

Advantage has been unanimously taken of this by surgeons who used to postpone the operative treatments of defects of the hard palate till the child had reached the age of three or more, often four or five years, if indeed their treatment was not left to the dentist, who attempted to replace the deficiency with an obturator. While the jaws grew, the nasal cavities did not develop proportionately, so that after a time the surgeon had to deal with a cleft which had become relatively narrower, but with a condition in which the nasal cavity was correspondingly deficient in calibre.

It was the recognition of this law that made me revolutionize the operative treatment of cleft palate. In order to restore to the nasal cavities at the earliest possible period in the lifetime of the individual the influence of the mechanical factor which is essential to its satisfactory development, I closed the defect in the palate on the day of birth or as soon after as the case presented itself. I did this as I recognized that the changes in the first week are extraordinarily rapid and extensive, and that they diminish in degree as the child grows older.

In order to recall to your minds the practice followed by surgeons at that time, I will quote a few lines from Treves' "System of Surgery": "In the infant the cleft is by almost all surgeons rightly deemed inoperable. In the child, after the age of two years, the chief importance of the malformation is the defect of speech which is occasioned. It is well, therefore, to be prepared for the fact that the closure of the cleft in no way remedies the defect of articulation. Of prime importance is the question, at what age should the operation be performed? It may, I think, be laid down that whilst it is never wise to operate on a child under three years of age, the time of election is from this age up to six years."

My experience of surgery has been that what is universally accepted as true is invariably false. The teaching I have just quoted is no exception to this rule. The

newly-born child is always healthy, the capacity of its tissues to repair are at their best, its digestion has not been impaired by bad feeding and its resisting power reduced correspondingly. It appears to suffer very little from the operation, in that it does not cry or show evidence of pain, and it takes its food soon after the completion of the operation with apparent relish. The loss of blood is very slight, not exceeding that lost in a circumcision. In early infancy it is possible to provide a well-vascularized flap which is nearly three times as broad as can be obtained when the teeth have begun to encroach on the mucous membrane or to perforate it, since the mocu-periosteum covering the under and even the outer surface of the alveolus can be included in the flap.

In a complete cleft of the palate and lip the ideal operation is to close the cleft in the lip and hard palate on the day of birth, and that in the soft palate at the end of the third week. The objection to closing the cleft in the soft palate simultaneously in all cases is that by so doing an excessive strain may be thrown upon the soft palate on account of the interference to the passage of air through the nares that may result from the closure of the cleft in the lip. In some cases I have closed the cleft in the lip after having effected the closure of the defect in the entire palate. Each case must be treated on its merits.

The surgical procedure is very simple. An incision is made along the outer aspect of the alveolus on that side of the cleft which offers the most suitable flap. At the posterior limit of this incision another is made directly inwards to the free margin of the cleft, passing behind the point of exit of the posterior palatine nerves and vessels. The flap is then raised from the subjacent bone by means of an elevator, care being taken not to damage the nerves and vessels as they emerge from the bone and are distributed to the flap. An incision is made along the free edge of the other margin of the cleft. The point of an elevator is introduced between the edge of the muco-periosteum and the bone, and by means of it the muco-periosteum on that side is separated sufficiently to permit of the flap which has been reflected inwards from the opposite side being introduced beneath it. In this way the cleft is closed by a thick flap of tissue which is well vascularized and upon which there is no strain or tension of any sort. It is retained in position by a double row of horse-hair sutures. Horse-hair sutures are unirritating and can be left in place for an indefinite period. The lip is closed in the same simple manner. It is first separated sufficiently from the margin of the nostril to enable the form of the aperture in the nostril to be rendered as similar to its fellow as possible. An incision is then made along the junction of the skin and mucous membranes so as to form a large posterior flap of mucous membrane. The edges of this flap of mucous membrane are accurately coapted by means of horse-hair sutures. After this the skin edges are placed in perfect apposition. In this way a lip is obtained which possesses a maximum of mobility, a feature of great importance not only as regards the appearance of the individual, but also as influencing very materially the speech. After a suitable interval the cleft in the soft palate is closed by flaps, one being taken from the upper surface of one side of the cleft and one from the under surface of the other. By this means the functions of the muscles of the soft palate are left unimpaired. To carry out this procedure one had to devise a needle holder with very small needles in order that the delicate soft parts should sustain as little damage as possible. It would be quite impossible to perform this operation with the large, clumsy needles of various shapes attached to long handles which were in use at that time.

The surgeon who operates on a bad cleft of the palate is only one factor in the treatment of the case. The next stage in the procedure is to have the child most carefully educated as regards its speech. This would be undertaken as soon as the child had arrived at an age to appreciate such instruction. This portion of the treatment of is of great importance. I have received most valuable assistance in this from Mr. Macmahon.

The next expert is the dental surgeon who, by expanding the upper jaw and arranging the teeth, completes the cure of the patient, improving the appearance and speech of the patient simultaneously.

At the present time surgeons all over the world have recognized the importance of operating on these cases early in life, though they differ somewhat in the details of their operative procedures. Time has shown that the conclusions I arrived at many years ago have proved correct in

every particular. It is probable that the early operation has suffered from its having sometimes been undertaken without that familiarity with detail and the skill necessary to insure success.

When I first called attention to the mechanical influence which the free passage of air exerts upon the development of the nasal cavities and of the bones that surround them, and of the cavities which communicate with them, I was met by a storm of opposition from the surgeons who devoted their energies to the treatment of diseases of the nose and throat. This arose from the fact that I pointed out that a considerable benefit accrued to cases of lymphatic infection of the naso-pharynx from careful attention to the efficiency in which the respiratory function was performed, since by it not only was the general vitality of the patient and the resisting power to the invasion by organisms reduced, but the forcible ventilation of the naso-pharynx helped to develop the naso-pharynx, and to remove the infection of the lymphatic tissue, and so to reduce the necessity for operative interference.

I cannot illustrate this opposition better than by quoting from the lectures of the then leading throat surgeon, who spent much time and trouble in attempting to refute my arguments. That the opposition was merely useful as a stimulant is shown by the fact that not only do laryngologists now generally recognize the value of breathing exercises but they form a portion of the routine of board school education. The following is the quotation:

"Well, gentlemen, I may be an incurable skeptic, but I have no hesitation in telling you that I do not believe for a moment that a single child which has got well-marked adenoids has been, or ever will be cured by breathing exercises, all reports to the contrary notwithstanding. I mean no disrespect to Mr. Arbuthnot Lane, but I cannot help saying that the whole idea seems to me preposterous." "If it should be called unscientific to say plainly that the rationale of his treatment was a mystery to me I for one must plead guilty to that soft impeachment. How a genuine lymphoid hypertrophy can ever be expected to be dispersed by breathing exercises completely passes my understanding." Since that time almost precisely the same language has been employed by eminent surgeons to describe their appreciation of the operative treatment of fractures, intestinal stasis, cleft palate, etc., apparently with much the same result. The following quotation delivered in 1896 in a lecture by the then President of the College of Surgeons on the operative treatment of fractures affords another illustration. "But I cannot conceive how anybody can believe that it is justifiable to convert a simple into a compound fracture; and of this I am certain, that the majority of surgeons for the present will remain content with the usual method of treatment." Time has shown that though his estimate of the intelligence of the majority was perfectly correct his views on the surgical treatment of fractures were absolutely wrong. As you will observe, his mental attitude was precisely the same as that of the throat specialist.

The next mechanical factor in the development of both jaws and of the bones to which the masticatory muscles are attached is the presence of the teeth. They act in two ways. One is by occupying space, the other by the transmission of pressure. The strain exerted by the muscles that work the jaws filled with strong teeth exercises a marked effect on the shape of the bones to which they are attached. This is shown very clearly by the changes which the edentulous jaw undergoes. The presence or absence of teeth exercises a very marked influence on the form and function of the temporo-maxillary joint.

The chief factor in the development of the lower jaw is the tongue. The lower jaw, apart from the influence of the teeth, may be regarded as a box accommodating the tongue. The mechanical influence exerted by the tongue is demonstrated by the fact that a progressive hypertrophy of the tongue in a growing subject is associated with a corresponding increase in the size of the lower jaw. On the other hand, any condition that interferes with the normal development of the tongue influences the development of the lower jaw prejudicially. As one would expect, the younger the subject the more marked the changes are. A hypertrophy of the tongue in young life whether due to a progressive enlargement of the tongue from some congenital condition, or from a tumor, or from a gumma, causes such an increase in the size of the lower jaw that the edges of the incisor teeth of the lower jaw impinge directly on those of the upper, producing what is called an edge-to-edge bite. Asso-

ciated with this an open bite is often present. Later the lower incisor teeth protrude beyond the upper, an underhung bite resulting.

On the other hand any condition which tends to reduce the size of the tongue by limiting its range of movement and so interfering with its normal muscular development, is associated with a corresponding degree of imperfect development of the inferior maxilla. This is illustrated very clearly in the case of any disease limiting the range of movement in the temporo-maxillary joint or resulting in its ankylosis, such as septic infection of the joint or rheumatoid arthritis. On the removal of the disability by the exclusion of the ankylosed joint or the recovered mobility of the rheumatoidal joint, which follows immediately on the removal of the large bowel, the tongue rapidly develops and the jaw increases in size in a corresponding manner. This restoration in the size of the tongue and of the mandible may be stimulated by exercise such as the use of chewing gum. Again, I have seen the diminution in the size of the tongue which resulted from the treatment by drugs of gummatous enlargement, or from excision of a portion of its bulk, or from the removal of a tumor from its substance, result in a progressive diminution in the size of the lower jaw.

A point of some interest is that the size of the orifice of mouth varies directly with that of the lower jaw. I had a female child under my care who had a congenital tumor of the tongue. This organ protruded from her mouth. Her lower jaw was of great size and projected very considerably beyond the upper. She had an extreme condition of open bite. She had also an enormous mouth, which added to her disfigurement. I removed all that was necessary of the tongue with a piece of the lower jaw on either side. Her skeleton was then normal. She, however, clamored loudly that her mouth should be dealt with in a similar manner since the removal of part of the tongue and jaw made its size much more conspicuous than before. I managed to induce her to postpone any interference for some months. At the end of this time I found that the mouth had accommodated itself to the altered size of the lower jaw and was not abnormally large.

The International Journal of Orthodontia

PUBLISHED THE FIFTEENTH OF EVERY MONTH BY

THE C. V. MOSBY CO., 801-807 Metropolitan Bldg., St. Louis, Mo.

Foreign Depots—*Great Britian*—Hirschfeld Bros., Ltd., 263 High Holborn, W. C., London; *Australasia*—Stirling & Co., 317 Collins Street, Modern Chambers, Melbourne; *India*—"Practical Medicine," Egerton Street, Delhi; *Porto Rico*—Pedro C. Timothee, Rafael Cordero 68, San Juan, P. R.

Subscription Rates—Single Copies, 30 cents. To anywhere in United States, Cuba, Porto Rico, Canal Zone, Mexico, Hawaii and Philippine Islands, $3.00 per year in advance. Under foreign postage, $3.40.

Remittances—Remittances for subscriptions should be made by check, draft, postoffice or express money order, or registered letter, payable to the publishers, The C. V. Mosby Company.

Contributions—The editor will be pleased to consider the publication of original communications of merit on orthodontic and allied subjects, which must be contributed solely to this journal.

Opinions—Neither the editor or the publisher hold themselves responsible for the opinions of contributors, nor are they responsible for other than editorial statements.

Reprints—Requests for reprints of original articles must accompany manuscript, and will be furnished by the publishers at cost.

Communications—Contributed articles, illustrations, letters, and all other matter pertaining to the editorial department should be addressed to the Editor, Doctor Martin Dewey, 1016 East Armour Boulevard, Kansas City, Mo. All communications in regard to advertising, subscriptions, change of address, and books for review should be addressed to the publishers, The C. V. Mosby Company, 801-807 Metropolitan Building, St. Louis, Mo.

Illustrations—Such halftones and zinc etchings as in the judgment of the editor are necessary to illustrate articles will be furnished when photographs or drawings are supplied by the authors of said articles.

Advertisements—Objectionable advertisements will not be accepted for publication in this journal. Forms close fifteenth of month preceding date of issue. Advertising rates and sizes on application.

Change of Address—The publishers should be advised of change of subscriber's address about fifteen days before date of issue, with both new and old addresses given.

Nonreceipt of Copies—Complaints for nonreceipt of copies or requests for extra numbers must be received on or before the fifteenth of the month of publication; otherwise the supply is apt to be exhausted.

Entered at the Post Office at St. Louis, Mo., as Second-Class Matter.

EDITORIALS

The Case History.

With the current issue of the Journal a new department is inaugurated —that of *Case History*.

Nothing is so interesting to confrères in any science as the personal experience of fellow workers. It is actual experience that really teaches.

Medical literature is replete with Case Histories. Entire volumes are now devoted to this class of literature. Dr. Richard Cabot, of Boston, has just published a much appreciated and valuable system on Differential Diagnosis; but in reality it is a series of cases that came under his observation at the Massachusetts General Hospital.

Literature of this kind carries to its readers the personal touch. It tells of mistakes as well as successful methods and depicts the actual results obtained.

The Case History is not new. It has been a favorite method of imparting information to medical and dental readers for generations, and it is our purpose to feature it and to give our readers the most efficient information obtainable in this department.

Well known and experienced orthodontists will contribute Histories for each issue, which we trust will be of value to our readers. —*M. D.*

Who Is An "Orthodontist?"

AT THIS time when the profession is more or less divided as to whether they are practicing "orthodontia" or "orthodontics," the question has been raised as to who is an "orthodontist"? What are the moral and legal obligations assumed by one who advertises to the public by word or sign that he is an orthodontist? The position of the orthodontist from a legal standpoint has never been clearly determined.

In speaking of the legal standing of an orthodontist, the practice of orthodontia has in the past been controlled by the same laws as have governed the practice of dentistry, and it is well and proper that it should. As a result any one qualified to practice dentistry could also practice orthodontia. In fact, orthodontia is today included in the course of instruction in most of our leading dental colleges, and the legal conditions are such that any one who has fulfilled the requirements to practice dentistry can also practice orthodontia; but having the legal right to practice dentistry and orthodontia does not make one an "orthodontist." You may then ask: What is an orthodontist?

From the accepted use of the word, an orthodontist is one who treats malocclusion of the teeth and facial deformities. He is supposed to possess more than the ordinary degree of skill. At the present time, we have no way of determining when a person possesses the required skill and training necessary to make him an orthodontist. There are requirements which one must fulfill to practice dentistry or medicine, and if the requirements are not met, legal difficulties are encountered. Since the practice of orthodontia is really a highly specialized branch of dentistry, and since all practitioners of orthodontia are in a sense specialists, the only legal difference existing between the dentist and the orthodontist is the same as exists between the physician and the surgeon. A surgeon must be a physician but a physician need not necessarily be a surgeon. We understand a surgeon to be one who possesses more than ordinary skill along certain lines. Rhinologists and pathologists are physicians who possess more than the ordinary skill and judgment in their respective branches of medicine. Therefore a medical practitioner who advertises by word, card, or sign that he is a surgeon, rhinologist or pathologist must necessarily bring to the aid of the one employing him as such, both in diagnosis and treatment, that degree of skill and knowledge which is ordinarily possessed by those who devote special study and attention to that particular branch of medicine. The general public is led to believe that any one designating himself by any term that denotes a specialty of medicine or dentistry is qualified to do work along that particular line far better than could be done by the average practitioner. This is a well known fact in medical jurisprudence and covers the field of the orthodontist just as positively.

There is no law which prevents any one legally engaged in the practice of dentistry from treating malocclusion, but there are moral and legal reasons why he should not call himself an orthodontist.

The moral reason is that the public has learned that the term "orthodontist" denotes one skilled above the ordinary in the treatment of malocclusion. This skill can be obtained in three ways:

First, by long years of practice, during which period one devotes a certain amount of time to the treatment of malocclusion and proves by the finished results that he has attained more than the ordinary skill. Second, by years of association with someone who has attained extraordinary skill and thereby becomes familiar with methods that will enable him to be an orthodontist in every sense of the word. Third, by a course of study and training in some school which has proven its ability to so educate students that they can treat malocclusion with more than the ordinary skill.

Any one who has had the proper training as mentioned in the above paragraph, would certainly be qualified to be known as an orthodontist. However, we find a number of men who by sign, card or word are claiming to be orthodontists, when in reality they do not possess the necessary qualifications. Any one who claims to be an orthodontist and begins the treatment of a case of malocclusion, with the patient or the parents of the patient believing he possesses more than the ordinary skill, is legally and morally responsible. If he does not show more than the ordinary amount of skill in the treatment of the malocclusion, he is liable. If suit was begun, and it was found that the person claiming to be an orthodontist could not qualify according to one of the three above mentioned requirements, judgment could be easily obtained.

We have known of several cases where practitioners, though not possessing the qualifications mentioned, have placed signs on their doors, or inserted notices in the papers, claiming to be orthodontists. There is no legal way to prevent any one entitled to practice dentistry from calling himself an orthodontist; but to do so, makes one liable in the same manner that a specialist of medicine is liable. Therefore, the orthodontist assumes a greater responsibility than the general practitioner when he treats malocclusion. The orthodontist is required by law to use greater skill and obtain better results. In assuming these extra responsibilities, the orthodontist is entitled to fees which will reimburse him for the responsibilities assumed and the skill used in the treatment of the case. Unfortunately, it is the increased fees and not the increased responsibility which has led many men to call themselves "orthodontists." About the fees and the responsibilities, we will have more to say later. —*M. D.*

ORTHODONTIC NEWS AND NOTES

This Department is in charge of Dr. H. C. Pollock, 808-809 Metropolitan Building, St. Louis. To avoid delay, communications in regard to notes should be sent direct.

A Suit for Damages to the amount of $10,000 has been filed against Dr. Frank C. Rodgers of St. Louis. The grounds for such action being the supposition that orthodontic treatment was responsible for the loss of a tooth. The case will be heard in the Circuit Court in the near future, the outcome of which will be published in the Journal.

* * * *

British Society for the Study of Orthodontics.—The annual general meeting for the year 1914 was held at 11 Chandos Street, Cavendish Square, W., on Wednesday evening, 9th December, 1914, Mr. Norman G. Bennett, President, in the chair. The Hon. Secretary read the minutes of the ordinary general meeting held on November 11th, 1914, which were confirmed. The President said that as no private nominations had been received, he declared the following gentlemen, who had been nominated by the Council, elected for the ensuing year:

President, Mr. W. Francis Mellersh; Immediate Past President, Mr. Norman G. Bennett; Vice-Presidents, Mr. J. E. Spiller, Mr. J. Lewin Payne, Mr. W. W. James; Secretary, Mr. Harold Chapman; Treasurer, Mr. H. C. Highton; Curator, Mr. B. Maxwell Stephens; Editor, Mr. Carl Schelling; Librarian, Mr. J. W. Doherty; Councillors, Mr. Hedley C. Visick, Mr. A. H. Clogg, Mr. Sheldon Friel.

* * * *

Eastern Association of Graduates of the Angle School of Orthodontia.—The regular meeting of this association was held in Boston on Saturday, March 27th, 1915. Afternoon session was held at the Boston Medical Library, No. 8 Fenley, commencing at 3 o'clock, with the following program:

Dr. Ernest A. Hootan.—"Evolution of the Human Face and Its Relation to Head Form." An illustrated lecture on Anthropology gave special attention to the cranial and facial development.

Dr. Lawrence W. Baker, Boston.—Subject not announced.

Dr. A. L. Morse.—Clinic, "The Morse Diagnostic Chart."

Dinner was served at the Hotel Puritan, No. 390 Commonwealth Ave., after which Dr. van N. Dearborn delivered a lecture on "Habit and Malocclusion." Dr. Dearborn spoke regarding child's psychology with special reference to habit.

The annual meeting of the Eastern Association of Graduates of the Angle School of Orthodontia will be held in the Academy of Medicine in New York City on May 20th, 21st and 22nd.

* * * *

Mouth-Breathing: Its Causes and Results.—Nose-breathing has three purposes, viz, to warm the inspired air, to add moisture to it and to remove from it mechanical, chemical, and bacterial impurities. Infection with tubercle bacilli is predisposed to by mouth-breathing. Some of the results which may follow mouth-breathing are as follows: (1) Changes in the thorax, which, especially in the child, may result in want of expansion of the highest and lowest areas of the lung; ultimately, apical induration may result. (2) Anemia, which is secondary to disturbances of digestion resulting from insufficient mastication, and to poor appetite. (3) Mental damage, which may be quickly removed as the result of adenectomy.

As the most common cause of mouth-breathing, postnasal adenoids come easily first. Other causes are nasal synechia, hypertrophic rhinitis, and deviation of the nasal septum. As to disturbances of development of the jaws and teeth in children affected with adenoids, it is still a matter of discussion what in these anomalies is cause, what consequence, and what merely an accompaniment.—*J. W. Samson, Zahnaerztliche Orthopaedie und Prothese.* (*Dental Cosmos.*)

* * * *

Dr. C. M. McCauley, 434 Wilson Building, Dallas, Texas, has announced to the dentists and physicians of the State that he has entered the special field and will confine his practice exclusively to the treatment of pyorrhea alveolaris and dental irregularities.

KANSAS CITY DENTAL COLLEGE

AT HOME IN OUR

NEW BUILDING

Owing to rapid growth of CLINIC, it has been necessary to double the capacity of our INFIRMARY

WRITE FOR **CATALOGUE** OR CALL UPON

CHARLES CHANNING ALLEN, Secretary

N. W. Cor. 10th and Troost Ave. **KANSAS CITY, MO.**

St. Louis Dental College

DEPARTMENT OF THE

ST. LOUIS UNIVERSITY

Next term begins October 1, 1915. For catalogue and full information address

J. P. HARPER, Dean

Grand and Caroline Sts. **ST. LOUIS, MISSOURI**

PRACTICAL ORTHODONTIA

BY

MARTIN DEWEY, D.D.S., M.D.

Professor of Dental Anatomy and Orthodontia, Kansas City Dental College,
President of Dewey School of Orthodontia; Editor-in-chief,
International Journal of Orthodontia

325 PAGES—MORE THAN 350 ENGRAVINGS
PRICE, CLOTH, $3.50

The Last Word on Orthodontia.

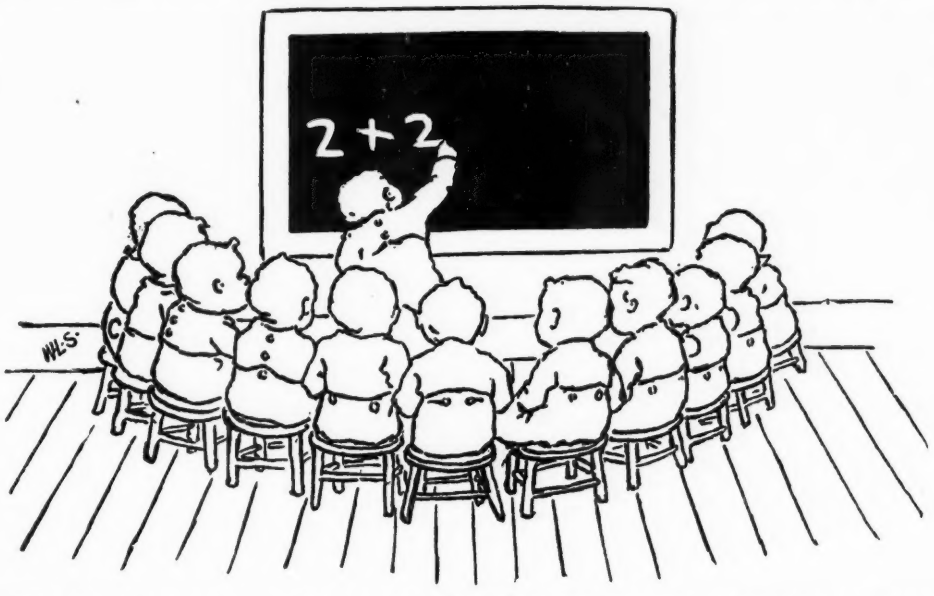
In Dewey's "Practical Orthodontia" dentists will find a book that will be a real help. The author has kept constantly in mind the need of practitioners. His years of training in the Angle School of Orthodontia under Doctor Edward H. Angle, supplemented by the experience gained during the eight years he has taught orthodontia in the Kansas City Dental College and in the Dewey School of Orthodontia, has given him a grasp on the subject enjoyed by few men.

That there is a crying need for such a book none will deny who is familiar with the situation as it exists at the present time. That this volume will fill this longfelt need is the unanimous verdict of all who have reviewed the book or who know of the author's qualifications to prepare such a work. Its size, arrangement, illustrations and reasonable price make it an ideal book.

SEND FOR ILLUSTRATED CIRCULAR

THE C. V. MOSBY COMPANY
MEDICAL AND DENTAL PUBLISHERS
801-807 METROPOLITAN BUILDING ST. LOUIS, U. S. A.

A SIMPLE PROBLEM



THE LAW OF DIMINISHING RETURNS

is as definite and fixed as the law of gravitation.
For example, a saturated solution of salt and water is a solution containing as large an amount of salt as the water is capable of dissolving. A given amount of water will dissolve a definite quantity of salt, thus producing a saturated solution.
To add an excess of salt to a saturated solution of salt and water is to apply the law of diminishing returns.
The law of diminishing returns applies with equal force to the percentage of copper incorporated as a germicidal agent in

Smith's Copper Cement

The percentage of copper in this material is sufficient to produce a saturated solution of the copper salts. (*)
It is possible for us under our method of manufacture to incorporate a larger percentage of copper than required to produce a saturated solution, but to do so would not enhance the germicidal properties of the material to the slightest extent.
And although **SMITH'S COPPER CEMENT** carries a sufficient amount of copper to produce the desired results, we guarantee without any qualification that it

WILL NOT DISCOLOR IN THE MOUTH

Made in 8 Shades in the Laboratories of

LEE S. SMITH & SON CO., Pittsburgh, Pa.

(*) A report on the Disinfecting Action of Copper, Raymond F. Bacon, Ph. D., January 25th, 1915.

Orthodontic Appliances

Dental Laboratories

Full and Complete Line of

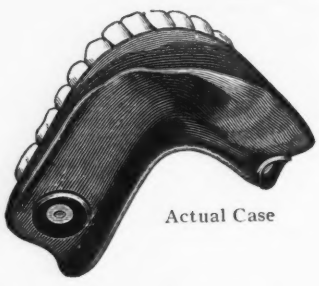
Dental Supplies

Hettinger Bros. Mfg. Co.

Kansas City, Mo. **Oklahoma City, Okla.**

St. Louis Dental Mfg. Co. **St. Louis, Mo.**
(Hettinger Bros.)

Deformities



Actual Case

Caused by operations, corrected by using the "EUREKA" retainer.

Could there by a more convincing picture as to their use in odd cases? Full account of this case appeared in an issue of *Dental Cosmos.*

Compare simplicity of renewing cup with others.

Upper or Lower, $2.00 per box of six

EUREKA SUCTION CO.
Loudonville, Ohio.

Sherman's

Bacterial Vaccines

Preparations With A Record For
EFFICIENCY

In the treatment of mouth infections, Bacterial Vaccines are now recognized as most efficient remedies. This will include mandibular, septic apical and dento-alveolar abscesses, and pyorrhea. Sherman's List No. 40 or 35 are admirably adapted for these uses.

Sherman's New All Glass Syringe
An Unusual Value, Price $2.00
Two Platin Needles, Self-Sterilizing Cap over Needle and Metal Case

Patent Applied for

Write for Literature

G. H. SHERMAN, M. D. **DETROIT, U. S. A.**